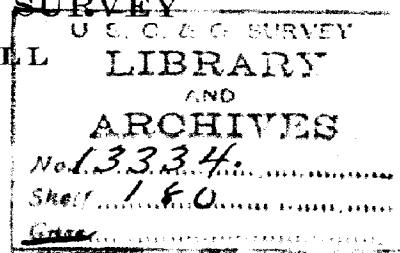


UNITED STATES
COAST AND GEODETIC SURVEY

T. C. MENDENHALL
SUPERINTENDENT



UNITED STATES COAST PILOT

ATLANTIC COAST

PART III

FROM CAPE ANN TO POINT JUDITH

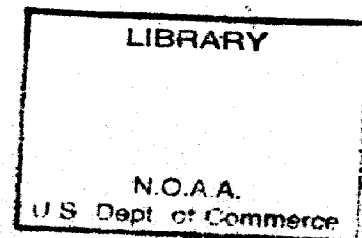
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UNITED STATES
COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *April 20, 1893.*

This volume covers the coast from Cape Ann, Massachusetts, to Point Judith, Rhode Island, including the bays, sounds, and harbors within these limits, and has been prepared as a part of a large volume which is designed to embrace the Atlantic coast of the United States.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations carried on in connection with its preparation.

The system adopted in this publication includes—

I. A tabular description of all lighthouses, light-vessels, and fog signals; lists of life-saving stations, Weather Bureau wind signal display stations, and seacoast telegraph stations; and information regarding tides, tidal currents, variation of the compass, etc.

II. General information concerning the several bodies of water and harbors, including notes relative to pilots and pilotage, towboats, depth of water, draught of vessels entering, harbor and quarantine regulations, supplies, facilities for making repairs, usual or best anchorages, and other matters of practical interest. In each case the information of this nature precedes the sailing directions and is printed in smaller type.

III. Sailing directions, with subordinate paragraphs treating of prominent objects, dangers, aids to navigation, etc. In the arrangement adopted the aim has been to conform, as far as practicable, to the order in which these matters would be considered in practice, and to render available such information as may be wanted promptly. For this purpose, and to afford a ready means of reference from one part to another, the sailing directions, where long, are divided into numbered or lettered sections, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Appendices.

This volume has been prepared by Lieut. Edwin H. Tillman, U. S. N., assisted by Mr. John Ross, the work being under the general direction of Lieut. Comdr. S. M. Ackley, U. S. N., Hydrographic Inspector Coast and Geodetic Survey.

The aids to navigation are correct to April 20, 1893.

As absolute accuracy in a work of this class is scarcely possible, navigators will confer a favor by notifying the Superintendent of the Coast and Geodetic Survey of errors which they may discover, or of additional matter which they think, for the good of mariners, should be inserted.

T. C. MENDENHALL,

Superintendent.

NOTE.

All bearings and courses are *magnetic*.

All distances are in *nautical miles*.

Except where otherwise stated, all depths are at *mean low water*.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

The following order is observed in coloring and numbering the buoys in United States waters, viz:

1. In approaching the channel, etc., from seaward, RED BUOYS, with EVEN NUMBERS, will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.
2. In approaching the channel, etc., from seaward, BLACK BUOYS, with ODD NUMBERS, will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.
3. BUOYS painted with RED and BLACK HORIZONTAL STRIPES will be found on OBSTRUCTIONS, with channel ways on either side of them, and may be left on either hand in passing in.
4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID CHANNEL and must be passed close-to to avoid danger.

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, *a description of which will be given in the printed list of buoys*.

Perches, with balls, cages, etc., will, when placed on buoys, be at turning points, the color and number indicating on what side they shall be passed.

Nun buoys, properly colored and numbered, are usually placed on the starboard side, and can buoys on the port side of channels.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be colored like buoys) are constructed and distinguished with special reference to each locality, and particularly in regard to the background upon which they are projected.

Wherever practicable, the towers, beacons, buoys, spindles, and all other aids to navigation, are arranged in the list in regular order *as they are passed by vessels entering from sea*.

The position of the buoys enumerated in this list are shown on the charts of the United States Coast and Geodetic Survey, which are kept corrected from information furnished by the Inspectors of the Lighthouse Districts, for the changes in the aids to navigation rendered necessary from time to time to indicate the best channels.

The following symbols and abbreviations are used on the charts of the Coast and Geodetic Survey:

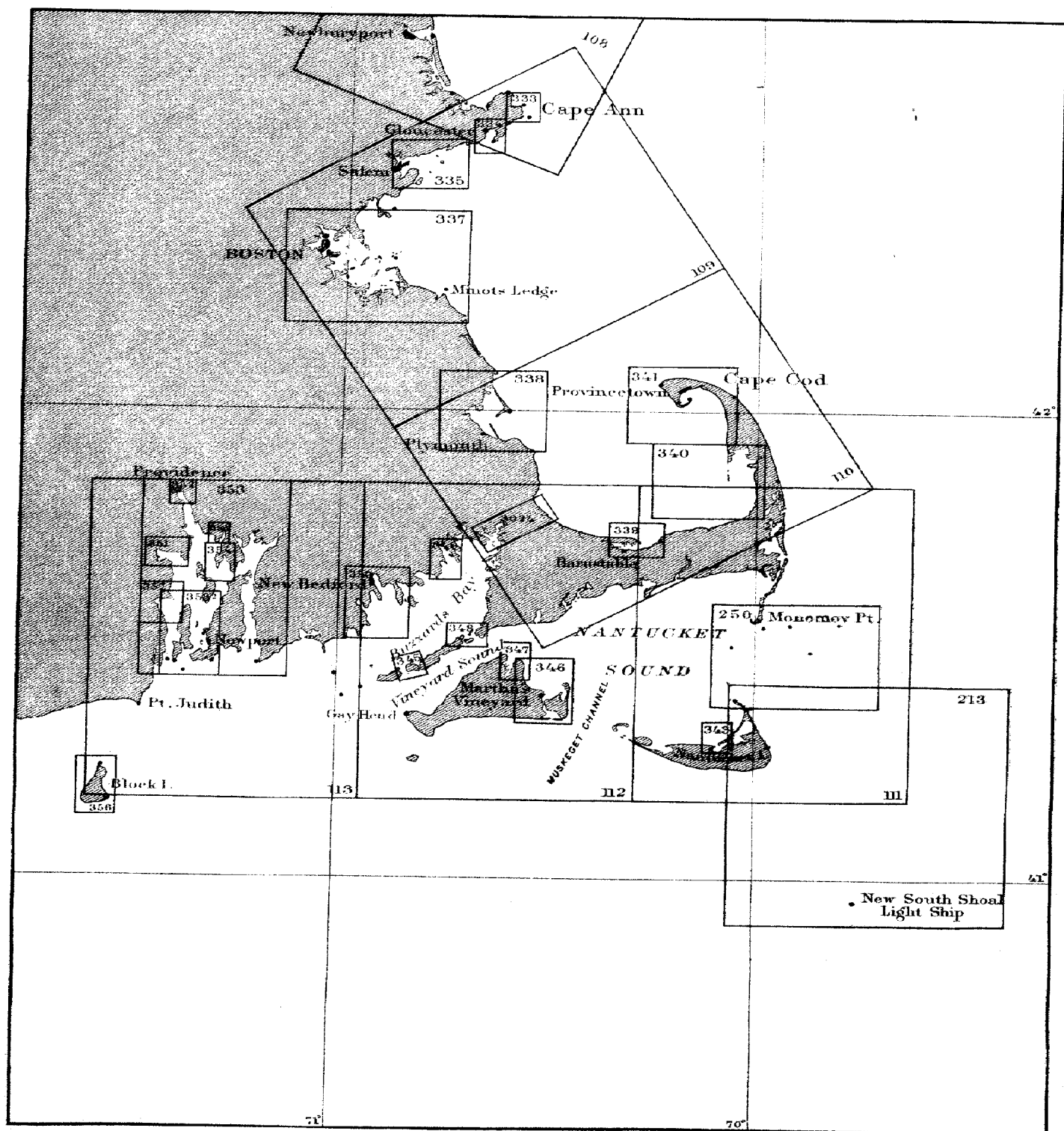
- ◊ Red buoys, with even numbers, to be left on starboard hand in entering.
- ◊ Black buoys, with odd numbers, to be left on the port hand in entering.
- ◊ Black and white perpendicular stripes, without numbers, midchannel or fairway buoys.
- ◊ or H. S., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

◊ Lighted buoys, different colors as above.

◊ WHISTLE, whistling buoys, different colors as above.

◊ BELL, bell buoys, different colors as above.

C., N., or S, signifies can, nun, or spar buoy.



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CAPE ANN TO BLOCK ISLAND

Scale 40000

ABBREVIATIONS

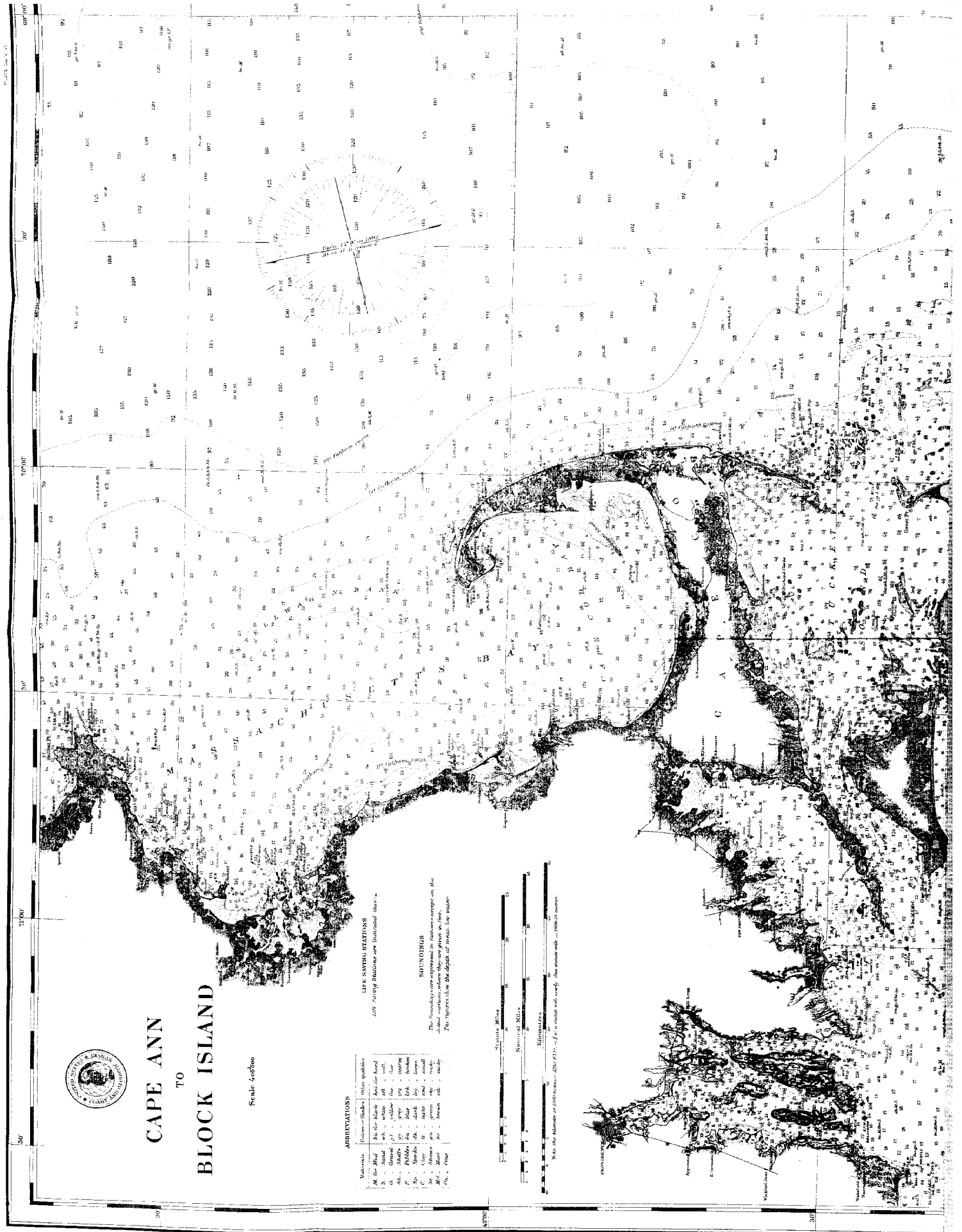
Material	Color or Shade	Other Qualities
M. for Mud	dk. blue	Red line hard
S. for Sand	wh. or white	off. or soft
G. for Gravel	gr. or yellow	fine or coarse
P. for Pebbles	br. or black	fine or coarse
Sp. for Shells	dk. or black	fine or coarse
C. for Clay	br. or black	fine or coarse
M. for Muds	br. or black	fine or coarse
Sh. for Shells	br. or black	fine or coarse

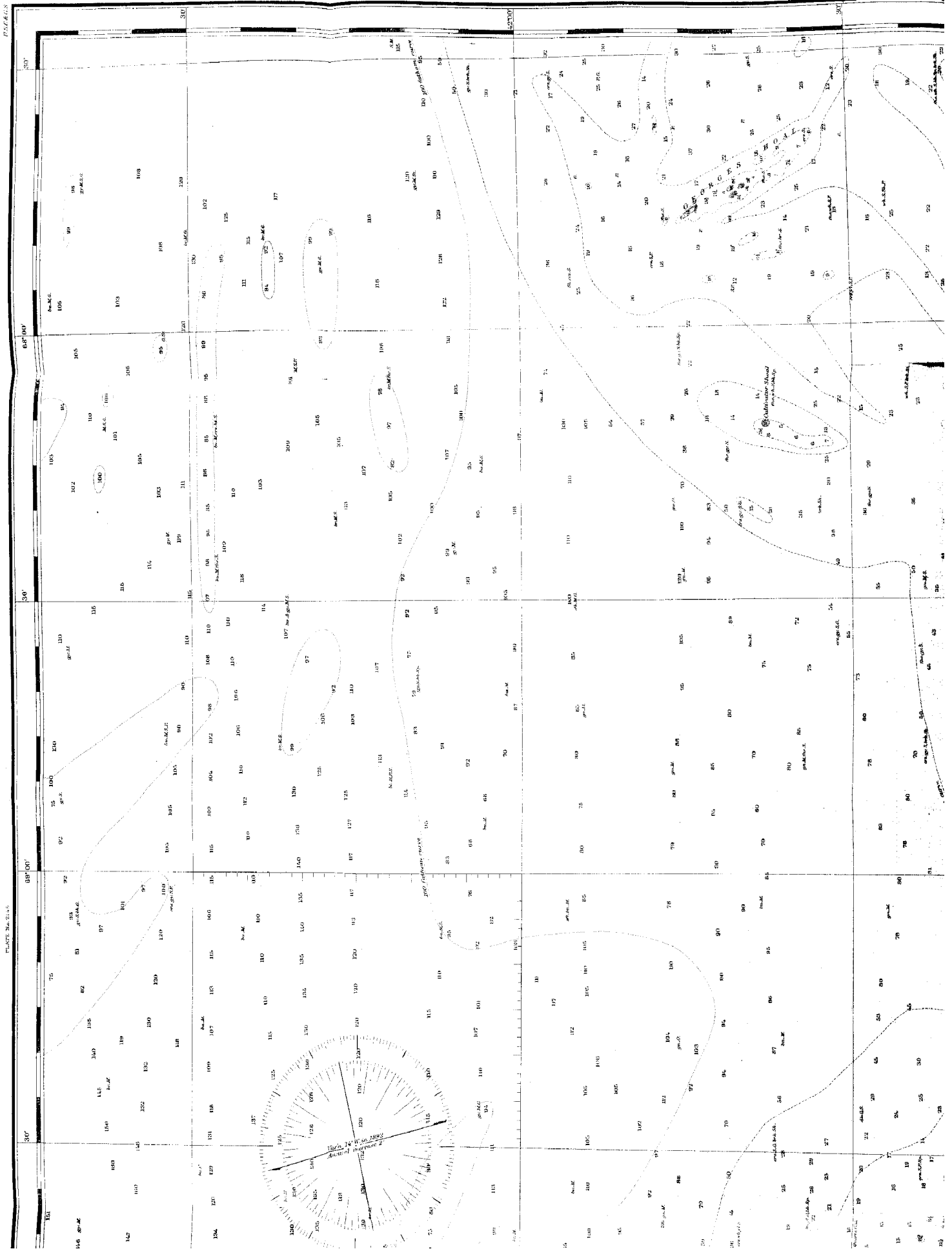
LIFE SAVING STATIONS

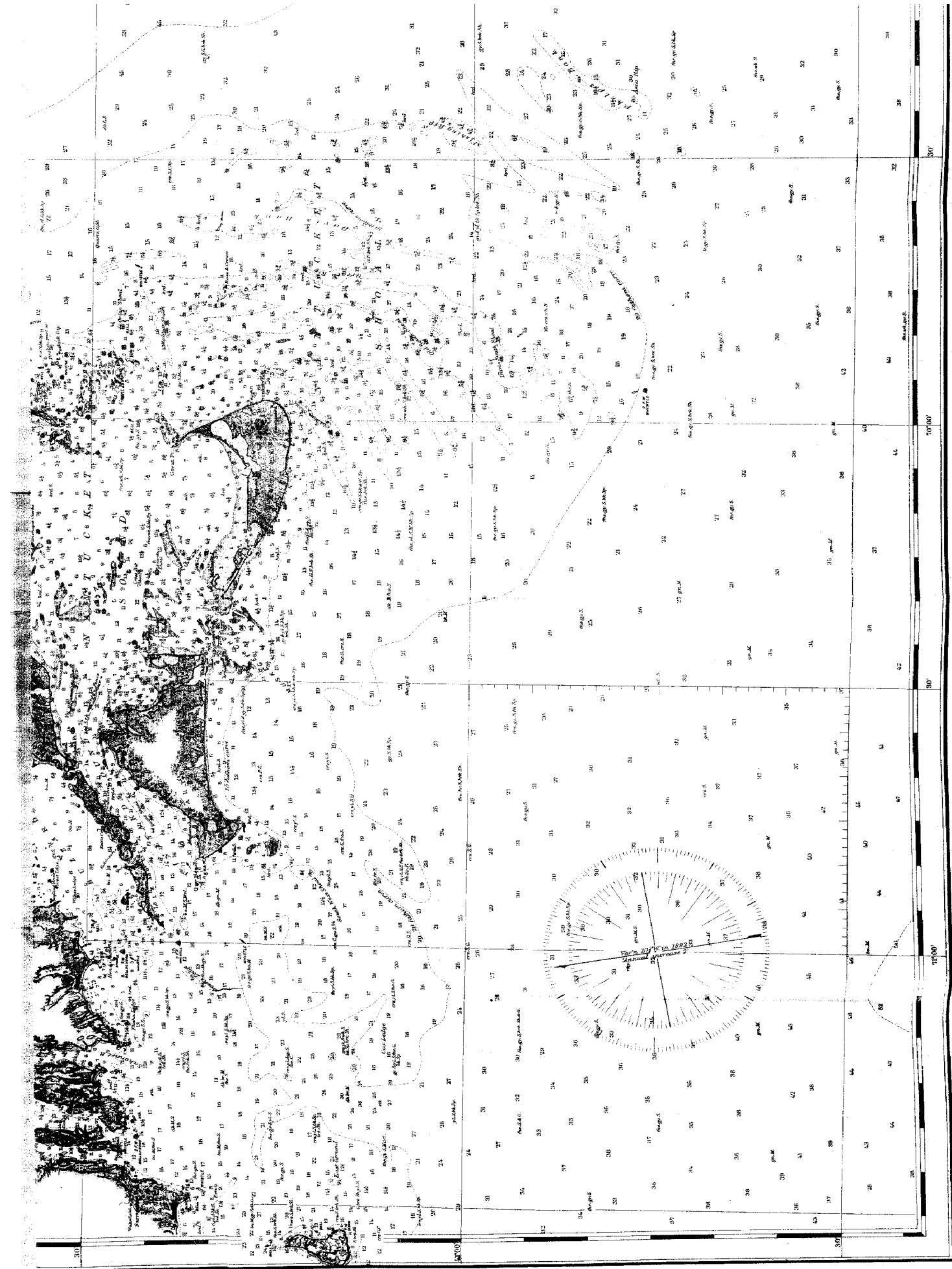
LIFE SAVING STATIONS are indicated thus:—

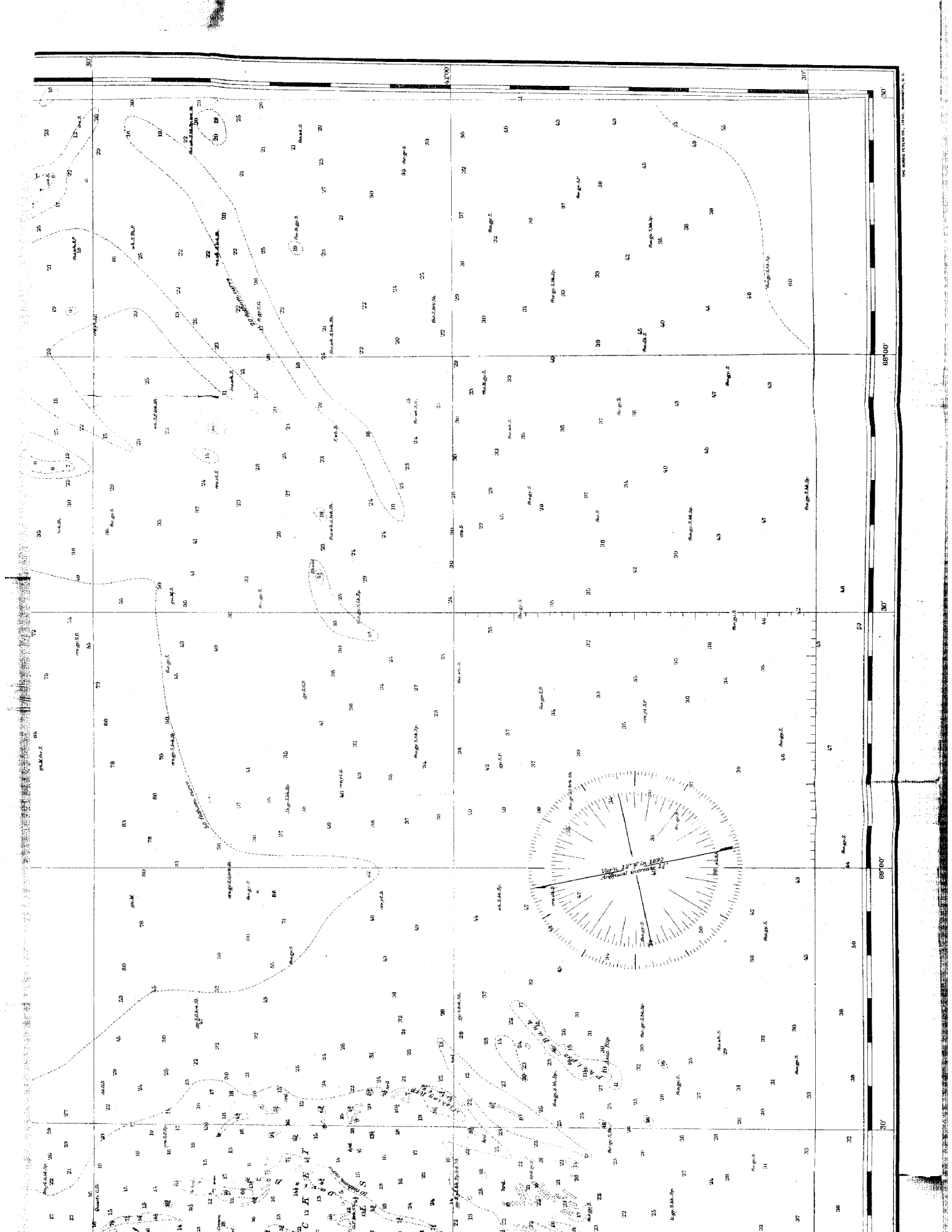
SOUNDINGS

The Soundings are expressed in fathoms except on the Atlantic coast where they are in feet. The figures show the depth at mean low water.









1892

1893

1894

1895

1896

1897

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART III.

FROM CAPE ANN TO POINT JUDITH.*

GENERAL REMARKS.

This volume, Part III of the "United States Coast Pilot, Atlantic Coast," covers the coast from Cape Ann to Point Judith; the coast of the United States to the westward of Point Judith, as far as Sandy Hook and including Long Island Sound, is covered by Part IV, and that to the eastward of Cape Ann by Part I-II, which also contains, a general description of the Gulf of Maine.

Within the limits covered by this volume, the natural features of the coast are very irregular and varied, as is also the hydrography along it. Between Cape Ann and Plymouth entrance, the coast is rocky, generally bold-to, with numerous islands, dry rocks, and sunken ledges lying near but detached from the shore, with deep channels between. The shores of Cape Cod Bay, the eastern and southern shores of Cape Cod, and shores of Nantucket Island are generally sandy with extensive sand shoals extending out well from the shore in many places; this is notably the case to the eastward of Monomoy Point and Nantucket Island; see description of Monomoy and Nantucket shoals. The coast of Marthas Vineyard is mostly sandy with boulders scattered along the shore in many places. The south shores of the Elizabeth Islands and the coast from the entrance to Buzzards Bay to Point Judith, including Narragansett Bay, are bold-to and generally rocky, with occasional sand strips, but off the shore numerous rocks, ledges, and shoals, with good channels between them, will be found. The shores of Buzzards Bay have many outlying rocks and ledges; near the head of the bay are extensive sand shoals.

Above only general features of certain parts of this extensive coast are mentioned, descriptions of certain parts and accurate information pertaining to the different bodies of water are given under the headings, Massachusetts Bay, Boston Bay, Cape Cod Bay, Nantucket and Vineyard Sounds, Buzzards Bay and Narragansett Bay.

For a stranger approaching the coast covered by this volume there are few, if any, prominent landmarks which can be readily recognized. The lighthouses form the guides in approaching or running along the coast; at night it is easy to pick up one light before losing another. The principal obstacles and difficulties which menace navigation along this coast are the outlying dangers, variable tidal currents, and fogs; the greatest danger from these being in the vicinity of Monomoy and Nantucket shoals. The most important harbors are Gloucester, Salem, Boston, Provincetown, Vineyard Haven, New Bedford, Newport, and Providence. These and a number of harbors and anchorages of lesser importance are described under the different headings.

The prevailing winds in summer are southwesterly and in winter northerly.

Fogs are liable to occur at any season, but are more frequent from April to October than at any other time during the year. They are usually brought by easterly and southerly winds and occasionally by southwesterly winds. Westerly and northerly winds clear away the fog.

Ice.—In severe winters some of the harbors are closed to navigation by ice, and there is more or less drift ice in all the harbors, in Cape Cod Bay, on Monomoy and Nantucket shoals, and in Nantucket and Vineyard sounds. In the principal harbors steamers and tugs usually keep a channel open. See "Ice" under the different headings.

Aids to navigation are numerous, the harbor entrances and most prominent points being marked by lighthouses and the principal dangers by buoys, beacons, or spindles; light-vessels are in position to mark some of the most frequented and difficult channels. The buoyage accords with the system adopted for United States waters. See page V, and also the table of lighthouses on pages 10-17.

Pilots.—There are licensed pilots for the ports in the States of Massachusetts and Rhode Island; only certain classes of vessels are exempt from the payment of pilotage. For rates of pilotage see "Pilot Laws" for States of Massachusetts and Rhode Island in Appendix I.

Quarantine.—The quarantine laws of the States of Massachusetts and Rhode Island govern the ports of those States. Local municipal officers have the power to make quarantine regulations for the ports under their control. See "Quarantine," Appendix I and Appendix IV.

U. S. Marine Hospital Service regulations are given in Appendix III.

Repairs.—There are docking facilities at Boston, New Bedford, and Providence, where also repairs can be made to the machinery of steamers. Large vessels and steamers can be docked only at Boston. See "Repairs" under headings, Beverly, Boston, New Bedford, and Providence.

* Shown on the following Coast and Geodetic Survey charts: A, Sailing Chart, scale $\frac{1}{1,200,000}$, price \$1; 7, General Chart of the coast, scale $\frac{1}{400,000}$, price \$0.50; 109, 110, 111, 112, 113, scale $\frac{1}{80,000}$, price of each \$0.50; and a number of harbor charts, on a larger scale, as noted under the several headings; all charts referred to in footnotes are issued by the Coast and Geodetic Survey.

Coast and Geodetic Survey charts can be obtained from the agents named in the list given on page VII. Facing page VI is an index map, showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts and other publications of the Survey also contains similar index maps; copies of this catalogue can be obtained free of charge on personal application at any of the sale agencies or by letter addressed to the Coast and Geodetic Survey Office, Washington, D. C.

13. Minots Ledge Lighthouse now flashes number 143 every 30 seconds, thus: 1 flash, dark 3 seconds; 4 flashes, dark 3 seconds; 3 flashes, dark about 15 seconds. The flashes are white and about 1 second in duration.

CAPE ANN TO POINT JUDITH.

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the Second and Third Lighthouse Districts of the United States. These districts extend from Hampton, New Hampshire, to the westward and southward as far as a point on the coast opposite the mouth of the Shrewsbury River, New Jersey. The Light list for the seacoasts of the United States and the Buoy lists for the Second and Third Districts give full descriptions of the aids to navigation.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
1	CAPE ANN (N. light).....	42 38 21 70 34 31	Fixed white.....	1	161½	19
2	CAPE ANN (S. light).....	42 38 13 70 34 32	Fixed white.....	1	166½	19
3	Eastern Point.....	42 34 49 70 39 54	Flashing red every 5 sec.....	4	61	13¾
4	Tenpound Island.....	42 36 (06) 70 39 (57)	Flashing white every 5 sec.....	6	43½	12
5	Baker Island.....	42 32 12 70 47 11	Fixed white.....	4	111	16½
6	Beacon.....		Fixed white.....	4	91½	15½
7	Hospital Point.....	42 32 48 70 51 23	Fixed white.....	3½	69¾	13¾
8	Fort Pickering.....	42 31 36 70 52 01	Fixed white.....	6	28¾	10½
9	Derby Wharf.....	42 31 00 70 53 03	Fixed red.....	6	22	7½
10	Marblehead.....	42 30 20 70 50 03	Fixed white.....	6	52½	11
11		Fixed white.....	Lens lantern.	126½	
12	Egg Rock.....	42 26 01 70 53 54	Fixed red.....	5	85¾	9½
13	MINOTS LEDGE.....	42 16 11 70 45 35	Fixed white	2	84½	14¾
14	Boston.....	42 19 41 70 53 26	Flashing white every 30 sec.....	2	102	16¾
15	Boston (Auxiliary).....		Fixed white, with two fixed red sectors; one red sector between NE. ¼ E. and NE. by E. ¾ E.; the other red sector between ENE. ¼ E. and ENE. ¾ E.	Ref'r	34	
16	Narrows.....	42 19 22 70 55 11	Fixed red.....	5	45	8½
17	Deer Island.....	42 20 24 70 57 18	Fixed white, varied by a red flash every 30 sec.	5	53	12¾
18	Long Island Head.....	42 19 (47) 70 57 (25)	Fixed white.....	3½	119½	16¾
19	Scituate Breakwater.....		Fixed red.....	Tub'lar lantern.	31	
20	Gurnet (Plymouth).....	42 00 12 70 36 04	Fixed white.....	4	102¾	16¾
21	Beacon.....		Fixed white.....	4	102¾	16¾
22	Duxbury Pier.....	41 59 15 70 38 57	Fixed white <i>red</i>	5	34¾	11
23	Race Point.....	42 03 45 70 14 37	Fixed white varied by a white flash every 90 sec.	4	41¾	11¾
24	Wood Edg.....	42 01 17 70 11 38	Flashing red every 15 sec.....	5	45	12
25	Long Point.....	42 01 59 70 10 09	Fixed white.....	5	35¾	11¾
26	Mayo Beach.....	41 55 (49) 70 02 (06)	Fixed white.....	Ref'r	36	
27	Billingsgate Island.....	41 52 18 70 04 10	Fixed white.....	4	41¾	11¾
28	Sandy Neck.....	41 43 22 70 26 (53)	Fixed white.....	5	67¾	12¾

LIGHTHOUSES—FOG SIGNALS.

11

CAPE ANN TO POINT JUDITH.

These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any ship-master on application to the Office of the Lighthouse Board, Washington, D. C., or to the Inspector of the Second Lighthouse District, Boston, Mass., and Inspector of the Third Lighthouse District, Tompkinsville, Staten Island, N. Y. They can also be had on application at the U. S. Branch Hydrographic Office, Maritime Exchange, Produce Exchange building, New York City.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
1	Two gray-stone towers; lanterns, black. Workrooms, stone color; covered walks and northern dwelling, white; one southern dwelling brick color and one white. A drab house stands W. of the brick dwelling. Brick fog-signal house near easterly shore of island, and red-brick oil house about midway between towers.	112½	10-inch steam whistle; blasts of 8 and 4 sec. alternate intervals of 4 and 44 sec.
2		112½	
3	White conical tower with black lantern; white dwelling to eastward and white bell tower to westward.	34½	Bell struck by machinery a double blow every 20 sec.
4	Brown conical tower; lantern, black. White dwelling E. of tower.	25	
5	Two white towers; lanterns, black. Southeastern tower, conical; northwestern tower, low octagonal pyramid, connected with a white dwelling by a covered way, 64 feet long. White bell tower stands N. of SE. tower.	54¼	Bell struck by machinery, a single and a double blow alternately, intervals 30 sec.
6		34½	
7	White pyramidal tower; lantern, black. Dwelling and outhouses, white.	40	
8	Brown conical tower with white base; lantern, black. White bridge from tower to shore.	32¼	
9	Square red tower, with black lantern.	17½	
10	White tower, lantern black; a white covered way, 100 feet long, extends nearly to dwelling. Dwelling and outhouses, white.	22½	
11	Lantern suspended from a white mast.	100	
12	Black lantern, on white dwelling.	21	
13	Dark gray granite tower, with black lantern.	89	Bell struck by machinery every 30 sec.
14	Conical white tower; lantern, black. White dwelling connected to tower by covered way, 80 feet long, large rain sheds, brick fog-signal house with frame annex, and square white building grouped closely about tower. Another white dwelling and small white structure to westward of group. Small brick oil house to southward of westerly dwelling.	80½	1st-class steam siren; blasts 5 sec., alternate silent intervals of 10 and 40 sec.
15	Small, white wooden structure.	9	
16	Black lantern on white dwelling; pile foundation.	45	Bell struck by machinery every 20 sec.
17	Conical brown tower; lantern, black; on black, cylindrical foundation pier expanding in trumpet-shape under main gallery, gallery covered by roof.		Bell struck by machinery every 10 sec.
18	Brown tower; lantern, black. White dwelling SE. of tower.	35¼	
19	Lantern suspended from a spar.		
20	Two white, octagonal pyramidal towers connected by covered way; lanterns, black; dwelling, white with green blinds.	34	
21		34	
22	Brown conical tower, with black lantern.	42	
23	Brown tower; lantern, black. Two white dwellings and barn. A brick fog-signal house about 150 feet northerly from tower.	35	12-inch steam whistle; blasts 4 sec., alternate silent intervals of 8 and 44 sec.
24	Pyramidal white tower; lantern, black. White dwelling 50 feet to NE.	34	
25	Square white tower; lantern, black. White dwelling stands S. and bell tower to the N.	32	Bell struck by machinery single and double blows alternately, intervals 30 sec.
26	Brown tower; lantern, black. White dwelling, W. of tower and close to it.	25	
27	Square red tower, connected with dwelling by a short covered way; lantern, black.	33½	
28	White tower; lantern, black. White dwelling, 20 feet W. of tower.	40¼	

CAPE ANN TO POINT JUDITH.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nau- tical miles.
29	CAPE COD	42 02 23 70 03 40	Fixed white	1	183	19 $\frac{3}{4}$
30	NAUSET BEACH	41 51 (39) 69 57 (05)	Fixed white	4	97	15 $\frac{1}{2}$
31			Fixed white	4	97	15 $\frac{1}{2}$
32			Fixed white	4	97	15 $\frac{1}{2}$
33	CHATHAM	41 40 18 69 57 01	Fixed white	4	79	14 $\frac{1}{2}$
34		41 40 17 69 57 01	Fixed white	4	79 $\frac{3}{4}$	14 $\frac{1}{2}$
35	Pollock Rip Light-Vessel, No. 47	41 32 (27) 69 55 (15)	Two fixed red	Ref'l'r	{ 37 } { 37 }	11 $\frac{3}{4}$
36	MONOMOY POINT	41 33 34 69 59 39	Fixed white, with fixed red sector between W. $\frac{1}{4}$ S. and W. $\frac{3}{4}$ N.	4	47	12 $\frac{3}{4}$
37	Shovelful Shoal Light-Vessel, No. 3	41 32 (29) 69 59 (07)	Fixed red	Ref'l'r	40	11 $\frac{1}{2}$
38	Handkerchief Light-Vessel, No. 4	41 29 (38) 70 03 (41)	Fixed white	Ref'l'r	40	11 $\frac{1}{2}$
39	Great Round Shoal Light-Vessel, No. 42	41 24 (26) 69 54 (29)	Two fixed white	Ref'l'rs	{ 45 } { 45 }	12
40	NANTUCKET (Great Point)	41 23 24 70 02 46	Fixed white, with a fixed red sector between E. $\frac{3}{4}$ S. and SE. by E. $\frac{1}{2}$ E.	3	69 $\frac{3}{4}$	13 $\frac{3}{4}$
41	SANKATY HEAD	41 17 01 69 57 57	Fixed white, varied by a white flash every minute.	2	166	19
42	Nantucket New South Shoal Light-Vessel, No. 54	40 46 (30) 69 56 (30)	Two fixed white	Ref'l'rs	{ 37 $\frac{3}{4}$ } { 37 $\frac{3}{4}$ }	11 $\frac{1}{4}$
43	GAY HEAD	41 20 55 70 50 08	Flashing white and red; interval between flashes 10 sec.; every fourth flash red.	1	170	19 $\frac{1}{4}$
44	Brant Point	41 17 23 70 05 35	Fixed white	4	48 $\frac{3}{4}$	12 $\frac{1}{4}$
45	Range { Nantucket Cliff (front)	41 17 38 70 06 24	Fixed white	Ref'l'r	15 $\frac{3}{4}$	
46	Range { Nantucket Cliff (rear)	41 17 36 70 06 25	Fixed red	Ref'l'r	26 $\frac{1}{4}$	
47	Stage Harbor	41 39 32 69 59 03	Fixed white	4	40	11 $\frac{1}{2}$
48	Base River	41 39 (06) 70 10 (11)	Fixed white	5	41	11 $\frac{1}{2}$
49	Bishop and Clerks	41 34 28 70 15 02	Flashing white with a flashing red sector between N. $\frac{1}{2}$ W. and NNE. $\frac{1}{2}$ E. Inter- val between flashes 30 sec.	4	56 $\frac{1}{4}$	13
50	Range { Hyannis	41 38 11 70 17 20	Fixed red	Ref'l'r	42 $\frac{1}{2}$	
51	Range { Beacon	41 38 (09) 70 17 (22)	Fixed red	Ref'l'r	22	
52	Cross Rip Light-Vessel, No. 5	41 26 (46) 70 17 (26)	Fixed red	Ref'l'r	39	11 $\frac{1}{2}$
53	Buccannesset Shoal Light-Vessel, No. 6	41 32 (02) 70 26 (41)	Fixed white	Ref'l'r	40	11 $\frac{1}{4}$
54	Cape Pogo	41 25 16 70 27 06	Fixed white	4	53 $\frac{3}{4}$	12 $\frac{3}{4}$

LIGHTHOUSES—FOG SIGNALS.

13

CAPE ANN TO POINT JUDITH—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
29	White tower and dwellings, connected by white covered ways; lantern, black. White fog-signal house to northeastward of dwelling.	55	1st-class Daboll trumpet; blasts 8 sec., silent intervals 30 sec.
30	Three white conical towers, 150 feet apart, ranging N. and S.; lanterns, black; dwelling and barn white.	18	
31		18	
32		18	
33		42½	
34	Two white conical towers, 100 feet apart, ranging N. and S.; lanterns, black. White dwelling between the towers.	42½	
35	Two masts, schooner-rigged; red hoop-iron day-mark at each masthead. Hull, red, with the words "POLLOCK RIP" in white letters on each side, and "47" on each bow.		12-inch steam chime whistle; blasts 5 sec., silent intervals 25 sec. If whistle be disabled, a bell will be rung by hand.
36	Red tower, connected with white dwelling by covered way; lantern, black	34¾	
37	Two masts, schooner-rigged; red hoop-iron day-mark at mainmast head. Hull, black, with white stripe, with the word "SHOVELFUL" in large white letters on each side, and "No. 3" on each quarter.		Bell or horn.
38	Two masts, schooner-rigged, black hoop-iron day-mark at each masthead. Hull, straw color, with the word "HANDKERCHIEF" in large black letters on each side, and "No. 4" on each quarter.		Bell or horn.
39	Two masts, schooner-rigged, no bow-sprit; black mastheads with galvanized-iron day-mark, lead color, at each. Hull, lead color, with "GREAT ROUND SHOAL" in large white letters on each quarter and "42" in large white figures on each bow and on the stern.		12-inch steam whistle; blasts 5 sec., silent intervals of 55 sec. If whistle be disabled a bell will be rung by hand.
40	White tower with covered way and white frame dwelling; lantern black. Small white oil-house to southward of dwelling.	65½	
41	Tower, white near the top and bottom, with red band in the middle; lantern, black. A white, framed, double dwelling and barn near southerly side of tower.	62	
42	Two masts, schooner-rigged, red hoop-iron day-mark at each masthead. Hull, red, with "NANTUCKET NEW SOUTH SHOAL," in white on each side, and "64" in large white figures on each bow. A smokestack and fog-signal are between the masts.		12-inch steam whistle; blasts of 2 and 6 sec., alternate silent intervals of 28 and 24 sec.
43	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds, white. Red brick oil house, near bluff, northwesterly from tower.	40	
44	White tower and dwelling connected by a short covered way; lantern, black	43¾	
45	Two small white pyramidal structures, with red roofs, about 300 feet apart, ranging SSW. ½ W. and NNE. ½ E.	11	
46		23¾	
47	Brown tower; lantern, black; brown dwelling, 50 feet S. of tower	36¾	
48	Black lantern on white dwelling	30	
49	Gray granite tower, with lead colored fog-bell tower attached to the W. side; lantern, black.	59½	Bell struck by machinery every 15 sec.
50	White tower and dwelling connected by a short covered way; lantern, black	19¾	
51	Small frame shed, painted lead color	15	
52	Two masts, schooner-rigged; white hoop-iron day-mark at each masthead. Hull, black, with white stripe, and the words "CROSS RIP" in white letters on each side, and "5" on each quarter.		Bell or horn.
53	Two masts, schooner-rigged; red hoop-iron day-mark at mainmast head. Hull, straw color, with the word "SUCCONASSAT" in large black letters on each side, and "6" on each quarter.		Bell or horn.
54	White tower; lantern, black. A white double dwelling S. of tower.	34¾	

CAPE ANN TO POINT JUDITH.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in na- tional miles.
55	Edgartown	41 23 27 70 30 13	Fixed white	4	48	12 $\frac{1}{4}$
56	East Chop	41 28 (13) 70 34 (06)	Fixed white	4	79	14 $\frac{1}{2}$
57	West Chop	41 28 51 70 36 01	Fixed white, with a fixed red sector, between WNW. and N. by W. $\frac{3}{4}$ W.	4	83 $\frac{1}{2}$	15
58	Nobeka Point	41 30 57 70 39 20	Fixed white, with a fixed red sector, between W. $\frac{1}{4}$ N. and NW. by W. $\frac{3}{8}$ W.	4	86 $\frac{1}{2}$	15
59	Tarpaulin Cove	41 28 08 70 45 29	Fixed white, varied by a white flash every 30 sec.	4	77 $\frac{1}{2}$	14 $\frac{1}{2}$
60	GAY HEAD	41 20 55 70 50 08	Flashing white and red; interval between flashes 10 sec.; every fourth flash red.	1	170	19 $\frac{1}{4}$
61	Vineyard Sound Light-Vessel (Sow and Pigs), No. 41	41 22 (47) 71 00 (00)	Two fixed red	Ref'r's	{ 34 } { 34 }	11
62	Hex and Chickens Light-Vessel, No. 2	41 27 (02) 70 01 (06)	Fixed white	Ref'r's	25	10
63	Cuttyhunk	41 24 (52) 70 57 (00)	Fixed white	5	61	12 $\frac{3}{4}$
64	Dumpling Rock	41 32 18 70 55 19	Fixed white	5	48	12 $\frac{1}{4}$
65	Clark Point	41 35 36 70 54 70	Fixed white	5	64	12 $\frac{3}{4}$
66	Palmer Island	41 37 37 70 54 35	Fixed white	5	34 $\frac{1}{4}$	11
67	[Fairhaven Bridge]	41 38 (20) 70 55 (08)	Twinkling red every 5 sec. (discontinued while Wamsutta Mill light is in opera- tion).	Ref'r	24	
68	Wamsutta Mill	41 38 (54) 70 55 (35)	Fixed white	Elec- tric.	91 $\frac{1}{2}$	
69	Ned Point	41 39 (03) 70 47 (46)	Fixed white	Lens lantern.	40 $\frac{1}{2}$	
70	Bird Island	41 40 (10) 70 48 (04)	Fixed white, varied by a white flash every 80 sec.	5	37	11 $\frac{1}{4}$
71	Wings Neck	41 40 (49) 70 59 (42)	Fixed white	5	48 $\frac{3}{4}$	12 $\frac{1}{4}$
72	Sakonnet	41 27 (10) 71 12 (09)	Fixed white for 30 sec., followed by three red flashes at intervals of 10 sec.	4	70	14
73	Brenton Reef Light-Vessel, No. 11	41 25 (52) 71 22 (36)	Two fixed white	Ref'r's	{ 50 } { 40 }	{ 12 $\frac{1}{2}$ } { 11 $\frac{1}{2}$ }
74	BEAVERTAIL	41 26 58 71 24 00	Fixed white	3	68	13 $\frac{3}{4}$
75	Castle Hill	41 27 (44) 71 21 (48)	Flashing red every 30 sec.	5	42	11 $\frac{3}{4}$
76	Fort Adams Fog-Signal Station	41 28 (53) 71 20 (18)				
77	Lime Rock	41 28 39 71 18 35	Fixed red	6	30	7 $\frac{1}{2}$
78	Goat Island Shoal Dolphin	41 28 (49) 71 19 (32)	Fixed white	Elec- tric.	20	
79	Newport Harbor (Goat Island)	41 28 36 71 19 39	Occulting, fixed white for 15 sec., followed by an eclipse of 5 sec.	4	33	11

LIGHTHOUSES—FOG SIGNALS.

15

CAPE ANN TO POINT JUDITH—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
55	Black lantern on white dwelling. A bridge, $\frac{1}{4}$ mile long, connects station with the shore.	36	-----
56	Brown tower; lantern, black. Dwelling and wood shed, white	35 $\frac{1}{4}$	-----
57	Cylindrical red brick tower, with brick service room attached; lantern, black; two white dwellings. Fog-signal house, white, with red roof, stands about 100 feet NE. of tower.	50 $\frac{1}{2}$	10-inch steam whistle; blasts 3 sec., silent intervals 27 sec.
58	Brown tower; lantern, black. A brown dwelling, with white trimmings, stands 40 feet E. of the tower. Bell tower, 320 feet SW. of tower.	35	Bell struck by machinery, single and double blows alternately, with intervals of 30 sec.
59	White tower; lantern, black; white dwelling and barn; pyramidal shingled bell tower at water's edge, westerly from lighthouse.	34 $\frac{1}{2}$	Bell struck by machinery every 15 sec
60	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds white. Red brick oil house, near bluff, northwesterly from tower.	41	-----
61	Two masts, schooner-rigged; red hoop-iron day-mark at each masthead. Hull red, with the words "VINEYARD SOUND" in large white letters on each side, and "41" on each bow.	-----	12-inch steam whistle; blasts 6 sec., silent intervals 45 sec. If whistle be disabled a bell will be rung by hand.
62	Two masts, schooner-rigged; black hoop-iron day-mark at mainmast head. Hull, black, with the words "HEN AND CHICKENS" in large white letters on each side, and "No. 2" on each quarter.	-----	Bell or horn
63	Conical, white, shingled tower with black lantern; connected by a white covered way with a white frame dwelling.	39 $\frac{1}{4}$	-----
64	Black lantern on white frame tower attached to NE. corner of white frame dwelling. Bell tower about 100 feet S. of lighthouse.	35	Bell struck by machinery, alternately a single and a double blow, with intervals of 30 sec.
65	Light on fort adjacent to former site.	59	-----
66	White tower and dwelling, connected by causeway 100 feet long; lantern, black.	34	-----
67	White wooden structure, with red roof.	18 $\frac{1}{2}$	-----
68	On tower of mill No. 3 of the Wamsutta corporation	-----	-----
69	White tower and dwelling; lantern, black.	33 $\frac{1}{2}$	-----
70	White tower and white frame dwelling; lantern, black.	31	-----
71	White, hexagonal, frame tower 20 feet SW. from white frame dwelling; lantern, black.	32 $\frac{1}{4}$	-----
72	White conical tower on brown cylindrical foundation; lantern, black.	43	-----
73	Two masts, schooner-rigged; circular black cage-work day-mark at each mast-head. Hull, straw color, with the words "BREXTON REEF" in large black letters on each side, and "11" in large black figures amidships on starboard side, and on the quarter on port side.	-----	Bell or gong rings continuously about 10 sec silent intervals about 30 sec.
74	Square granite tower, attached to SE. angle of white dwelling	45 $\frac{1}{2}$	10-inch steam whistle; blasts 4 sec., alternate silent intervals of 10 and 50 sec.
75	Conical granite tower on granite pier. Lantern, black.	-----	-----
76	Square pyramidal frame tower, base painted white, upper part shingled, natural color.	-----	Bell struck by machinery every 10 sec.
77	Lantern on NW. corner of white dwelling	13	-----
78	A clump of piles secured together by wire rope	-----	-----
79	White tower and attached dwelling, on the N. end of the breakwater.	29	Bell struck by machinery every 15 sec.

CAPE ANN TO POINT JUDITH.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nau- tical miles.
80	Rose Island	41 29 44 71 20 36	Fixed red	6	50	7½
81	Dutch Island	41 29 48 71 24 17	Fixed white	4	56	13
82	Gull Rocks	41 30 09 71 20 01	{ Fixed red (E. light) Fixed white (W. light) }	Turb'lar lan't's.	44	
83	Gould Island	41 32 03 71 20 37	Flashing white every 10 sec.	5	52	12½
84	Conanicut Island	41 34 25 71 22 20	Fixed red	5	47	8½
85	Wickford Harbor	41 34 22 71 20 14	Fixed white	5	52	12
86	Prudence Island	41 36 21 71 18 14	Fixed white	5	30	11
87	Hog Island Shoal Light-vessel, No. 12	41 37 (49) 71 16 (20)	Fixed white	Red'r	38	11½
88	Muscle Bed Shoals	41 38 (11) 71 15 (57)	Fixed red	6	35	7½
89	Bristol Ferry	41 38 35 71 15 39	Fixed white	6	35	11
90	Warwick	41 40 01 71 22 43	Fixed white	4	54	13
91	Borden Flats	41 42 (21) 71 10 (20)	Fixed red	5	50	8½
92	Conimicut	41 43 02 71 20 (46)	Fixed white	4	60	15
93	Bullock Point	41 44 16 71 22 (18)	Fixed red	6	50	7½
94	Sabine Point	41 45 44 71 22 (32)	Fixed white	6	51	11
95	Pomham Rocks	41 46 39 71 22 (12)	Fixed red	6	69	7½
96	Fuller Rock	41 47 38 71 22 (48)	Fixed white	6	28	10
97	Sassafras Point	41 49 (00) 71 23 (30)	Fixed red	6	25	7½
98	Whale Rock	41 26 40 71 25 27	Fixed red	4	73	11¾
99	POINT JUDITH	41 21 40 71 28 55	Flashing white every 15 sec.	4	67	14

In the foregoing table the names of the lights are printed as follows, viz :

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS.

3d. Light-vessels.

4th. Sound, bay, and harbor lights.

The geographical positions of lighthouses which are uncertain by some seconds, not having yet been very accurately determined, and those of light-vessels which vary somewhat in position, have the seconds inclosed thus : 30° 45' (57'').

Bearings are taken from seaward.

CAPE ANN TO POINT JUDITH—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
80	Black lantern on white dwelling, with Mansard roof -----	30	Bell struck by machinery, a double blow every 15 sec.
81	Square white tower and attached dwelling -----	35	Bell struck by machinery every 15 sec.
82	Wedge-shaped wooden building, with truncated gable ends -----	33	Bell struck by machinery every 5 sec.
83	Conical red-brick tower, surmounted by a black lantern. Keeper's dwelling—first story, red brick; second story and roof, shingled, natural color; stands 30 feet southerly of tower.	30	Bell struck by machinery every 15 sec.
84	Square wooden tower on corner of frame dwelling. Tower and dwelling, white; lantern, black.	37	Bell struck by machinery, a double blow every 30 sec.
85	Square white tower and attached dwelling standing on a red iron pier; lantern, black.	42	Bell struck by machinery every 20 sec.
86	White octagonal tower -----	25	Bell struck by machinery every 15 sec.
87	Two masts, schooner-rigged; square black cage-work day-mark at foremast head. Hull lead-color, with the words "HOG ISLAND SHOAL" in large black letters on each side, and "No. 12" in black, on each quarter.		Bell.
88	Lantern on gable of small red dwelling, standing on square granite pier -----	19	Bell struck by machinery every 20 sec.
89	Square white tower, and dwelling attached; lantern, black -----	28	
90	Square white tower on old stone dwelling, detached frame dwelling to northward.	28	Bell struck by machinery, a single and a double blow, alternately; intervals 20 sec.
91	White, conical tower on brown cylindrical foundation; lantern, black -----	35	Bell struck by machinery every 15 sec.
92	White, conical tower on brown cylindrical foundation -----	60	Bell struck by machinery every 15 sec.
93	Drab dwelling, with gable roof, from the middle of which rises a square tower, surmounted by black lantern with black railings. The structure stands on a rectangular granite pier.	35	
94	White octagonal tower; on granite dwelling with Mansard roof; lantern, black. The structure stands on a pier of rock-faced granite.	36	
95	Square white tower in the center of the front of a dwelling with Mansard roof; lantern, black.	37	
96	White portable beacon, hexagonal in form, on a granite pier; lantern, black.	14	
97	White portable beacon, hexagonal in form, on a granite pier; lantern, black -----	14	
98	White conical tower, on red cylindrical foundation; lantern, black.	73	Bell struck by machinery a double blow every 20 sec.
99	White tower, connected with dwelling -----	46	1st-class steam-siren; blasts 6 sec., intervals 40 sec.

In the column of "Distance visible, in nautical miles," will be found the distances at which the lights can be seen, under ordinary states of the atmosphere, by observers at elevations of fifteen feet above the level of the sea.

In the column of "Characteristic of light," the time between flashes is given from beginning of one flash to the beginning of the next succeeding one, and bearings are given from seaward.

Vessels approaching or passing light-vessels of the United States in *foggy* or *thick weather* will be warned of their proximity by the sounding of a *bell, fog horn, or whistle*, on board of the light-vessels, at intervals not exceeding five minutes.

The fact should be noted that sound signals are not always reliable. The sound may be lost while really approaching it, after being heard; or even when approached until close-to, it may not be heard at all, though properly made. These conditions are the exception, not the rule. They are, however, always possible and render great care necessary.

CAPE ANN TO POINT JUDITH.

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate relative positions of certain aids to navigation along the coast. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

Cape Ann Lighthouses.—The following are bearings and distances from Cape Ann Lighthouses:—

	Miles.
Portsmouth Harbor (New Castle) Lighthouse, N.....	26½
Boon Island Lighthouse, NNE.....	29
Cape Elizabeth (East) Lighthouse, NNE. ½ E.....	58
Seguin Lighthouse, NE. ½ N.....	73
Monhegan Island Lighthouse, NE. ½ E.....	87
Cape Cod Lighthouse, S. by E. ½ E.....	42½
Race Point Lighthouse S. ½ E.....	37
Sandy Neck Lighthouse, S.....	56
Gurnet (Plymouth) Lighthouse, S. by W. ½ W.....	37½
Minots Ledge Lighthouse, SW. by S.....	23½
Boston Lighthouse, SW. ½ W.....	23
Long Island Head Lighthouse, SW. by W.....	25
Eastern Point Lighthouse, SW. by W. ½ W.....	5½
Egg Rock Lighthouse, SW. by W. ½ W.....	18½

Eastern Point Lighthouse.—The following are bearings and distances from Eastern Point Lighthouse:—

Cape Cod Lighthouse, SSE. ½ E.....	41½
Race Point Lighthouse, S. by E. ½ E.....	36½
Sandy Neck Lighthouse, S. ½ E.....	53½
Gurnet (Plymouth) Lighthouse, S. ½ W.....	34½
Minots Ledge Lighthouse, SSW. ½ W.....	19½
Whistling buoy off NE. Graves, SW. ½ W.....	15½
Baker Island Lighthouse, WSW. ½ W.....	6

Minots Ledge Lighthouse.—The following are bearings and distances from Minots Ledge Lighthouse:—

Marblehead Lighthouse, N.....	14½
Baker Island Lighthouse, N. ½ E.....	16
Cape Cod Lighthouse, SE. ½ E.....	34
Race Point Lighthouse, SE. ½ E.....	26½
Billingsgate Island Lighthouse, SE. ½ S.....	38½
Sandy Neck Lighthouse, S. by E. ½ E.....	38½
Gurnet (Plymouth) Lighthouse, S. by E.....	17½
Boston Lighthouse, NW. ½ W.....	6½
Whistling buoy off NE. Graves, NNW.....	8
Nahant Head, NNW.....	11

Race Point Lighthouse.—The following are bearings and distances from Race Point Lighthouse:—

Buoy off end of Billingsgate Shoal, S.....	14½
Sandy Neck Lighthouse, S. by W. ½ W.....	20½
Gurnet (Plymouth) Lighthouse, W.....	16½
Boston Lighthouse, NW. ½ W.....	32½
Whistling buoy off NE. Graves, NW. ½ N.....	39½
Nahant Head, NW. ½ N.....	36
Marblehead Lighthouse, NNW. ½ W.....	37½
Baker Island Lighthouse, NNW. ½ W.....	37

Cape Cod Lighthouse.—The following are bearings and distances from Cape Cod Lighthouse:—

Cape Elizabeth (East) Lighthouse, N. ½ E.....	91½
Seguin Lighthouse, N. by E. ½ E.....	100½
Monhegan Island Lighthouse, NNE. ½ E.....	108
Boston Lighthouse, NW. ½ W.....	40½
Marblehead Lighthouse, NW. ½ N.....	44
Baker Island Lighthouse, NW. by N.....	43½
Isles of Shoals Lighthouse, N. by W.....	61
Boon Island Lighthouse, N. ½ W.....	67½

BEARINGS AND DISTANCES.

19

Nantucket (Great Point) Lighthouse.—The following are bearings and distances from Nantucket (Great Point) Lighthouse:—

Handkerchief Light-vessel, N. $\frac{1}{2}$ E.....	6 $\frac{1}{2}$
Monomoy Point Lighthouse, NNE. $\frac{1}{2}$ E.....	10 $\frac{1}{2}$
Shovelful Shoal Light-vessel, NNE. $\frac{1}{2}$ E.....	9 $\frac{1}{2}$
Pollock Rip Light-vessel NE. $\frac{1}{2}$ N.....	10 $\frac{1}{2}$
Whistling buoy Entrance to Pollock Rip Slue, NE. $\frac{1}{2}$ N.....	13 $\frac{1}{2}$
Whistling buoy Entrance to South Channel E. $\frac{1}{2}$ S.....	15 $\frac{1}{2}$
Great Round Shoal Light-vessel, E. $\frac{3}{4}$ S.....	6
Sankaty Head Lighthouse, S. by E. $\frac{3}{4}$ E.....	7 $\frac{1}{2}$
Bell buoy off Nantucket Entrance SW. $\frac{1}{2}$ S.....	5 $\frac{1}{2}$
Cape Poge Lighthouse, WNW. $\frac{3}{4}$ W.....	18 $\frac{1}{2}$
Buoy on N. end Tuckernuck Shoal, WNW. $\frac{1}{2}$ W.....	6 $\frac{1}{2}$
East Chop Lighthouse, WNW.....	24 $\frac{1}{2}$
Cross Rip Light-vessel, NW. by W. $\frac{3}{4}$ W.....	11 $\frac{1}{2}$
Bishop and Clerks Lighthouse NNW. $\frac{1}{2}$ W.....	14 $\frac{1}{2}$
Hyannis Lighthouse N. $\frac{1}{2}$ W.....	16 $\frac{1}{2}$

Handkerchief Light-vessel.—The following are bearings and distances from Handkerchief Light-vessel:—

Monomoy Point Lighthouse, NE. $\frac{1}{2}$ E.....	5 $\frac{1}{2}$
Shovelful Shoal Light-vessel, NE. by E. $\frac{1}{2}$ E.....	4 $\frac{1}{2}$
Pollock Rip Light-vessel, ENE. $\frac{1}{2}$ E.....	6 $\frac{1}{2}$
Great Round Shoal Light-vessel, SE. $\frac{3}{4}$ S.....	8 $\frac{1}{2}$
Bell buoy off Nantucket Entrance, S. by W. $\frac{1}{2}$ W.....	10 $\frac{1}{2}$
Cross Rip Light-vessel, W. $\frac{1}{2}$ S.....	10 $\frac{1}{2}$
Bishop and Clerks Lighthouse, NW. $\frac{1}{2}$ W.....	9 $\frac{1}{2}$
Hyannis Lighthouse, N. by W. $\frac{1}{2}$ W.....	10 $\frac{1}{2}$

Nobska Point Lighthouse.—The following are bearings and distances from Nobska Point Lighthouse:—

Succonesset Light-vessel, E. $\frac{1}{2}$ S.....	9 $\frac{1}{2}$
Cross Rip Light-vessel, SE. by E. $\frac{1}{2}$ E.....	16 $\frac{1}{2}$
Cape Poge Lighthouse, SE. $\frac{1}{2}$ E.....	10 $\frac{1}{2}$
West Chop Lighthouse, SE. $\frac{3}{4}$ S.....	3 $\frac{1}{2}$
Gay Head Lighthouse, SW. $\frac{1}{2}$ W.....	12 $\frac{1}{2}$
Tarpaulin Cove Lighthouse, W SW. $\frac{1}{2}$ W.....	5 $\frac{1}{2}$

Gay Head Lighthouse.—The following are bearings and distances from Gay Head Lighthouse:—

Tarpaulin Cove Lighthouse, NE. $\frac{1}{2}$ N.....	8
Nantucket New South Shoal Light-vessel, SE. $\frac{1}{2}$ S.....	53 $\frac{1}{2}$
NW. point No Mans Land, S. $\frac{1}{2}$ W.....	5 $\frac{1}{2}$
Cape Hatteras Lighthouse, SW. $\frac{3}{4}$ S.....	427
Cape Charles Light-vessel, SW. $\frac{3}{4}$ W.....	342 $\frac{1}{2}$
Five Fathom Bank Light-vessel, SW. by W. $\frac{1}{2}$ W.....	231 $\frac{1}{2}$
Whistling buoy, W SW. $\frac{1}{2}$ W.....	8
Block Island (SE.) Lighthouse, W. $\frac{1}{2}$ S.....	34 $\frac{1}{2}$
Block Island (N.) Lighthouse W.....	34 $\frac{1}{2}$
Little Gull Island Lighthouse, W. $\frac{1}{2}$ N.....	58 $\frac{1}{2}$
Race Rock Lighthouse, W. $\frac{1}{2}$ N.....	55 $\frac{1}{2}$
Watch Hill Lighthouse, W. $\frac{1}{2}$ N.....	47
Point Judith Lighthouse, WNW. $\frac{1}{2}$ W.....	30
Brenton Reef Light-vessel, WNW.....	24 $\frac{1}{2}$
Vineyard Sound Light-vessel NW. by W. $\frac{1}{2}$ W.....	7 $\frac{1}{2}$
Sakonnet Lighthouse, NW. by W. $\frac{1}{2}$ W.....	17 $\frac{1}{2}$
Cuttyhunk Lighthouse, NW. $\frac{1}{2}$ N.....	6 $\frac{1}{2}$

Hen and Chickens Light-vessel.—The following are bearings and distances from Hen and Chickens Light-vessels:—

Dumpling Rock Lighthouse NE. $\frac{1}{2}$ E.....	6 $\frac{1}{2}$
Wings Neck Lighthouse, NE. by E. $\frac{1}{2}$ E.....	21 $\frac{1}{2}$
N. and Penikese Island, E. $\frac{1}{2}$ S.....	4 $\frac{1}{2}$
Cuttyhunk Lighthouse, SE.....	3 $\frac{1}{2}$
Vineyard Sound Light-vessel, S.....	4 $\frac{1}{2}$
Block Island (SE.) Lighthouse, SW. by W. $\frac{1}{2}$ W.....	29 $\frac{1}{2}$
Block Island (N.) Lighthouse, W SW. $\frac{1}{2}$ W.....	28 $\frac{1}{2}$
Point Judith Lighthouse, W. $\frac{1}{2}$ S.....	21 $\frac{1}{2}$
Brenton Reef Light-vessel, W. $\frac{1}{2}$ N.....	15 $\frac{1}{2}$
Sakonnet Lighthouse, WNW. $\frac{1}{2}$ W.....	8 $\frac{1}{2}$

CAPE ANN TO POINT JUDITH.

Brenton Reef Light-vessel.—The following are bearings and distances from Brenton Reef Light-vessel:—

Castle Hill Lighthouse, N NE. $\frac{1}{2}$ E.....	1 $\frac{1}{2}$
Sakonnet Lighthouse, E. $\frac{1}{2}$ S.....	7 $\frac{1}{2}$
Cuttyhunk Lighthouse, E SE. $\frac{1}{2}$ E.....	19
Vineyard Sound Light-vessel, ESE.....	17
NW. point No Mans Land, SE. by E.....	26 $\frac{1}{2}$
Block Island (N.) Lighthouse, SW. $\frac{1}{2}$ W.....	15
Point Judith Lighthouse, SW. by W. $\frac{1}{2}$ W.....	6 $\frac{1}{2}$
Whale Rock Lighthouse, NW. by W. $\frac{1}{2}$ W.....	2 $\frac{1}{2}$
Beavertail Lighthouse, N NW. $\frac{1}{2}$ W.....	1 $\frac{1}{2}$

Nantucket New South Shoal Light-vessel.—The following are bearings and distances from Nantucket New South Shoal Light-vessel:—

Cape Hatteras Lighthouse, SW.....	414 $\frac{1}{2}$
Cape Charles Light-vessel, SW. by W. $\frac{1}{2}$ W.....	349 $\frac{1}{2}$
Five Fathom Bank Light-vessel, W SW. $\frac{1}{2}$ W.....	246
Sandy Hook Light-vessel, W. $\frac{1}{2}$ N.....	178 $\frac{1}{4}$
Fire Island Lighthouse, W. $\frac{1}{2}$ N.....	149 $\frac{1}{2}$
Montauk Point Lighthouse, W NW.....	88 $\frac{1}{2}$
Block Island (SE.) Lighthouse, NW. by W. $\frac{1}{2}$ W.....	77 $\frac{1}{2}$
Point Judith Lighthouse, NW. $\frac{1}{2}$ W.....	79
Brenton Reef Light-vessel, NW. $\frac{1}{2}$ W.....	76 $\frac{1}{2}$
W. end No Mans Land, NW.....	50

WIND SIGNAL STATIONS AND SEACOAST TELEGRAPH STATIONS.

The Wind signals of the U. S. Weather Bureau are shown for the benefit of mariners at the following stations. The signals are described and their meaning is explained in Appendix IF:

Gloucester, Mass.	Cape Cod Light, Mass.	Nobska Point, Mass.	Fall River, Mass.
Marblehead, Mass.	Chatham, Mass.	Woods Holl, Mass.*	Newport, R. I.
Hull, Mass.	Great Point, Mass.	Vineyard Haven, Mass.*	Point Judith, R. I.
Boston, Mass.	Nantucket, Mass.*	Tarpaulin Cove, Mass.	
Provincetown, Mass.	Hyannis, Mass.	New Bedford, Mass.	

The stations marked by an asterisk are seacoast telegraph stations of the U. S. Weather Bureau, which will report or signal vessels, when specially requested to do so, or in case of shipwreck. Vessels passing Cape Cod or Nobska Point lighthouses will, if they display their number, be reported at the marine headquarters in New York and Boston.

UNITED STATES LIFE-SAVING STATIONS.

The following is a list of life-saving stations on the coast covered in this volume. The geographical positions given are approximate and are taken from the Official Register of the service. These stations are furnished with life-boats, mortars, and all other appliances for affording assistance in cases of shipwreck.*

NAME OF STATION.	STATE.	LOCALITY.	APPROXIMATE POSITION.					
			Latitude North.			Longitude West.		
Point Allerton ..	Mass..	1 mile west of Point Allerton	42	18	20	70	54	00
North Scituate ..	Mass..	2 $\frac{1}{2}$ miles south of Minots Ledge light	42	14	00	70	45	30
Fourth Cliff.....	Mass..	South end of Fourth Cliff, Scituate	42	09	30	70	42	10
Gurnet	Mass..	4 $\frac{1}{2}$ miles northeast of Plymouth	42	00	10	70	36	10
Manomet Point..	Mass..	6 $\frac{1}{2}$ miles southeast of Plymouth	41	55	30	70	32	40
Race Point.....	Mass..	$\frac{1}{2}$ mile northeast of Race Point light	42	04	10	70	14	20
Peaked Hill Bars	Mass..	2 $\frac{1}{2}$ miles northeast of Provincetown	42	04	30	70	09	10
High Head	Mass..	3 $\frac{1}{2}$ miles northwest of Cape Cod light	42	03	40	70	06	30
Highland	Mass..	$\frac{1}{2}$ miles northwest of Cape Cod light	42	02	50	70	04	20
Pamet River ..	Mass..	3 $\frac{1}{2}$ miles south of Cape Cod light	42	00	00	70	01	10
Cahoons Hollow.	Mass..	2 $\frac{1}{2}$ miles east of Wellfleet	41	56	40	70	00	00
Nauset	Mass..	1 $\frac{1}{2}$ miles south of Nauset lights	41	50	30	69	56	40
Orleans	Mass..	Ahead of Ponchet Island	41	45	30	69	57	15
Chatham	Mass..	1 $\frac{1}{2}$ miles south-southwest of Chatham lights	41	39	10	69	55	50
Monomoy	Mass..	2 $\frac{1}{2}$ miles north of Monomoy light	41	35	20	69	59	00
Coskata	Mass..	2 $\frac{1}{2}$ miles south of Nantucket (Great Point) light	41	21	50	70	01	20
Surfside	Mass..	2 $\frac{1}{2}$ miles south of the town of Nantucket	41	14	30	70	06	00
Great Neck	Mass..	6 miles west of Surfside	41	16	00	70	12	30
Muskeget	Mass..	Near west end of Muskeget Island	41	20	10	70	19	20
Cuttyhunk	Mass..	Near east end, Cuttyhunk Island	41	25	15	70	54	45
Brenton Point ..	R. I..	On Princes Neck	41	26	58	71	20	10
Narragansett Pier	R. I..	Northern part of the town	41	36	00	71	27	20
Point Judith.....	R. I..	Near light	41	21	40	71	29	00

* Instructions to enable mariners to avail themselves fully of the assistance thus afforded will be sent free of charge upon application to the General Superintendent of the Life-Saving Service, Washington, D. C.

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MASSACHUSETTS HUMANE SOCIETY LIFE-SAVING STATIONS—COAST OF MASSACHUSETTS.

List of lifeboats, gun stations, and huts of refuge, 1892.

No. of Station.	LOCALITY OF STATION.	REMARKS.
4	Emerson Point, Cape Ann	Lifeboat.
5	Brace Cove, Gloucester	Lifeboat, Hunt gun and apparatus.
6	Rocky Neck, East Gloucester	Lifeboat.
7	Stage Fort, Gloucester	Hunt gun and apparatus. Life-dory.
8	Magnolia	Lifeboat.
9	Baker Island, Salem Harbor	Life-dory.
10	Marblehead	Two lifeboats, Hunt gun and apparatus.
11	Galloupes Point, Swampscott	Lifeboat and life-dory. Dory kept on the fishing beach.
12	Lynn Beach	Lifeboat.
13	Nahant	Lifeboat, Hunt gun and apparatus.
14	Deer Island, Boston Harbor	Lifeboat, Hunt gun and apparatus.
15	Boston Light	Small lifeboat in Government house, Hunt gun and apparatus.
16	Hough Neck, Quincy	Small lifeboat.
17, 18	Stony Beach, Hull	Lifeboat, Hunt gun and apparatus.
19	Point Allerton	Lifeboat.
20	(Nantasket Beach (between Point Allerton and Strawberry Hill))	Lifeboat.
21	Nantasket Beach, Sagamore Hill	Lifeboat, Hunt gun and apparatus.
22	Gun Rock Cove, Cohasset	Lifeboat.
23	Pleasant Beach, Cohasset	Lifeboat, Hunt gun and apparatus.
24	Cohasset Harbor	Lifeboat.
25	Glades, Scituate	Lifeboat.
26	North Scituate	Lifeboat, Hunt gun and apparatus.
27	Scituate Light	Lifeboat.
27A	Scituate	Hunt gun and apparatus.
28	Bass Cove, Scituate	Large and small lifeboat.
29, 30	Third Cliff, Scituate	Lifeboat, Hunt gun and apparatus.
31	Brant Rock	Lifeboat, Hunt gun and apparatus.
32	Manomet	Lifeboat.
33	Barnstable	Lifeboat.
34	Sandwich	Lifeboat.
35	Race Point Light	Hunt gun and apparatus.
40	Nauset Harbor	Lifeboat, Hunt gun and apparatus.
42	Cuttyhunk	Lifeboat, Hunt gun and apparatus.
43	Cuttyhunk Light	Two lifeboats and dory, Hunt gun and apparatus.
50	Nantucket	Lifeboat, Hunt gun and apparatus.
51	Quidnet, Nantucket	Lifeboat.
52	Siasconset, Nantucket	Lifeboat, Hunt gun and apparatus.
54	Forked Ponds, Nantucket	{ Lifeboat and life-dory, Hunt gun and apparatus. Also fitted for hut of refuge.
55	Hummock Pond, Nantucket	Lifeboat and life-dory. Fitted like preceding.
56	Broad Creek, Nantucket	Lifeboat and life-dory. Fitted like preceding.
57	Tuckernuck, Nantucket	Lifeboat.
58	Cliffs, Nantucket	Lifeboat and life-dory.
65	Cape Poge, Marthas Vineyard	Lifeboat, Hunt gun and apparatus.
66	Chappaquiddick	Lifeboat, Hunt gun and apparatus.
67	Squibnocket, Marthas Vineyard	Lifeboat, Hunt gun and apparatus.
68	Gay Head, Marthas Vineyard	Lifeboat, Hunt gun and apparatus.
69	Westport Point	Lifeboat.

CAPE ANN TO POINT JUDITH.

TIDES. †

GENERAL TABLE.

LOCALITY.	Corrected Estab- lishment.	MEAN RISE AND FALL.			MEAN DURATION OF—		
		Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.	Stand.
	h. m.	Feet.	Feet.	Feet.	h. m.	h. m.	h. m.
Gloucester Harbor.....	11 02	8.9	10.1	7.7	6 13	6 12	0 15
Salem Harbor.....	11 16	9.2	10.5	7.9	6 13	6 12	0 06
Boston, Navy Yard.....	11 29	9.8	11.2	8.4	6 12	6 13	0 09
Boston Light.....	11 09	9.5	10.8	8.2	6 13	6 12	0 11
Plymouth Harbor.....	11 03	9.2	10.1	8.3	5 54	6 31	0 10
Barnstable Harbor.....	11 29	9.2	9.9	8.5	6 05	6 20	0 12
Provincetown Harbor.....	11 29	9.2	10.5	7.9	6 12	6 13	0 21
Nantucket (Great Point) Light.....	12 06	3.2	3.7	2.7	6 29	5 56	0 08
Chatham Roads.....	11 50	7.0	7.9	6.1	6 08	6 17	0 10
Nantucket Harbor.....	12 29	3.1	3.5	2.7	6 29	5 56	0 10
Hyannis Harbor.....	12 23	3.1	3.6	2.6	6 58	5 27	0 09
Edgartown Harbor.....	12 16	2.0	2.3	1.7	6 55	5 30	0 24
Vineyard Haven Harbor.....	11 43	1.7	1.9	1.5	6 50	5 35	0 20
Woods Holl.....	8 34	1.7	2.0	1.4	5 16	7 09	0 38
Quicks Hole.....	7 38	3.1	3.6	2.6	6 09	6 16	0 39
New Bedford Harbor.....	8 00	4.2	4.8	3.6	6 39	5 46	0 35
Wings Neck Light.....	7 59	3.8	4.4	3.2	6 45	5 40	0 30
Beavertail Light.....	7 40	3.8	4.4	3.2	6 31	5 54	0 27
Newport Harbor.....	7 45	3.9	4.5	3.3	6 30	5 55	0 33
Fall River Harbor.....	8 01	4.5	5.2	3.8	7 11	5 14	0 30
Providence Harbor.....	8 14	4.5	5.2	3.8	7 10	5 15	0 30

VARIATION OF THE COMPASS.

The magnetic variations for 1893 and annual increase at points mentioned are as follows:

LOCALITY.	Compass variation.	Annual increase.
Off Cape Ann.....	13½ W.	3
Salem Entrance.....	13	2
Boston Entrance.....	12	2
Cape Cod Bay.....	12½	2
Off Nauset Lights.....	12½	1½
N. of Great Point.....	12	1½
Nantucket New South Shoal Light-vessel.....	11½	1
Cape Poge.....	11½	2
Gay Head.....	11½	2½
Buzzards Bay.....	11½	2½
Narragansett Bay Entrance.....	11½	3
Off Bristol, R. I.....	11½	3½

GENERAL DIRECTIONS ALONG THE COAST BETWEEN CAPE ANN AND POINT JUDITH.

1. *From a Position about 1.5 miles to the Eastward of Cape Ann Lighthouse.—I. If bound into Boston Harbor by the Broad Sound Channels.—*A SW. by W. course made good for 21 miles will lead to a position about ½ mile to the northward of the whistling buoy off The Graves. From this buoy follow the directions in sections 1A or 1B of the sailing directions for Boston Harbor.

Remarks.—The course leads clear of all dangers. In clear weather the shore to the northward will be plainly visible and several lighthouses will be seen. The course leads 1½ miles S. of Eastern Point Lighthouse and 1½ miles to the southward of Halfway Rock off Salem entrance. Long Island Head Lighthouse should be made ahead and Boston Lighthouse on the port bow.

† Tide Tables for the Atlantic Coast, published annually by the U. S. Coast and Geodetic Survey, predicting the times and heights of tides for every day of the year, at all the principal ports, can be obtained from the agents named in the list given on page VII; price, \$0.55.

II. If bound into Boston Harbor by the Main Channel make good a **SW. $\frac{1}{4}$ W.** course for 22 $\frac{1}{2}$ miles; Boston Lighthouse should then bear **W.** and the course should be laid about **W. $\frac{1}{2}$ S.** so as to pass about $\frac{3}{4}$ mile to the southward of it; then enter as directed in section 2 of the sailing directions for Boston Harbor.

Remarks.—The dangers in approaching the entrance are described under section 1 of the sailing directions for Boston Harbor. Outer Brewster, Boston Lighthouse, and Point Allerton will be made a little on the starboard bow, and Three-and-a-half Fathom Ledge and Martin Ledge, each marked by a red buoy, will be left at least $\frac{1}{2}$ mile on the starboard hand.

III. If bound to Plymouth Harbor.—A **S. by W. $\frac{3}{4}$ W.** course made good for nearly 38 $\frac{1}{2}$ miles will lead up to the whistling buoy at the entrance and to a position from which Gurnet Lighthouse will bear **NW.** by **W. $\frac{1}{4}$ W.**, distant about $\frac{3}{4}$ mile. To enter, proceed as directed in the sailing directions for that harbor.

Remarks.—Manomet Hill, to the southward of the entrance, will be made right ahead and can easily be seen in clear weather for a distance of 20 miles. The Standish monument on Captain Hill will be made a little on the starboard bow, and can be seen from a distance of 15 to 18 miles. Gurnet Lighthouse will be made a very little on the starboard bow.

IV. If bound to Provincetown Harbor.—A **S. $\frac{1}{2}$ E.** course made good for 37 miles will lead to a position about 1 $\frac{1}{2}$ miles **W.** of Race Point Lighthouse, from which follow the directions for entering Provincetown Harbor.

Remarks.—Race Point is low and in the daytime the lighthouse can not be seen a great distance, but there are no dangers if a vessel passes more than $\frac{1}{4}$ mile to the westward of Race Point Lighthouse.

V. To abreast Cape Cod Lighthouse.—Make good a **S. by E. $\frac{3}{4}$ E.** Easterly course for 42 $\frac{1}{2}$ miles; Cape Cod Lighthouse should then bear **W.** distant about 2 miles, from which position if bound through Nantucket and Vineyard Sounds follow the sailing directions in sections 1 or 1A for those sounds. If bound outside of Nantucket Shoals follow the directions in section 2 following.

2. From abreast Cape Cod Lighthouse to Nantucket New South Shoal Light-vessel.—When 2 miles to the eastward of Cape Cod Lighthouse make good a **S. by E. $\frac{3}{4}$ E.** course for 73 miles, then change the course to **W. by S.** The latter course made good for 39 miles should lead up to Nantucket New South Shoal Light-vessel (see page 12), from which follow the directions in section 3 following.

Remarks.—On the **S. by E. $\frac{3}{4}$ E.** course care must be taken not to be set by the ebb current to the southward on to Nantucket Shoals. The course leads about 4 miles to the eastward of Nauset Beacons and 10 miles to the eastward of Chatham Lighthouse, and so far to the eastward of Monomoy, Nantucket, and Sankaty Head lighthouses that they will not be visible. No heavy draught vessel should attempt to sight Sankaty Head Lighthouse when to the eastward or southeastward of it.

The **W. by S.** course leads about 3 miles to the southward of the southern end of Fishing Rip (which has a least depth of 4 fathoms and is frequently marked by strong tide rips), and about 4 miles to the northward of Phelps Bank. See the description of Monomoy and Nantucket shoals.

The soundings on the sailing lines are very irregular and are of but little use in determining a ship's position. When rounding Nantucket Shoals in thick and foggy weather safety may be insured by taking frequent soundings and hauling off shore when a sounding of less than 25 fathoms is obtained; such a means will, however, take a vessel farther off shore than the sailing lines above given.

3. From Nantucket New South Shoal Light-vessel.—The bearings and distances on page 20, will assist the mariner in laying a course for points to the westward of Block Island.

I. If bound into Buzzards Bay.—A **NW. $\frac{1}{4}$ W.** course made good for 58 miles will lead up to the whistling buoy from which Gay Head Lighthouse bears **E NE. $\frac{7}{8}$ E.**, distant 8 miles. From this buoy steer **N. $\frac{1}{4}$ E.** for Hen and Chickens Light-vessel, passing to the westward of Vineyard Sound Light-vessel. When nearly up to Hen and Chickens Light-vessel follow the sailing directions for Buzzards Bay.

Remarks.—The course leads well clear of all dangers and passes about 2 $\frac{1}{2}$ miles to the southwestward of No Man's Land. The ebb current sets to the southward and flood to the northward.

II. *If bound into Narragansett Bay.*—A NW. $\frac{3}{4}$ W. course made good for 76½ miles will lead up to Breton Reef Light-vessel, from which be guided by the sailing directions for entering Narragansett Bay.

Remarks.—The course leads clear of all dangers and about 3¼ miles to the southwestward of No Mans Land. Gay Head, which is prominent and easily recognized (see description), should be about 8 miles distant when on the starboard beam. Gay Head, Cuttyhunk, and Sakonnet Point lighthouses will be made on the starboard bow, Beavertail ahead, and Point Judith Lighthouse on the port bow.

III. *If bound through Block Island Sound to Long Island Sound.*—Make good a NW. by W. course for 79½ miles. Point Judith Lighthouse should then bear NE. $\frac{1}{2}$ N., distant 4 miles, and Block Island (N.) Lighthouse SW. $\frac{1}{2}$ S. distant 5 miles, and the course for Long Island Sound entrance is W.

Remarks.—The course leads 10 miles to the southwestward of No Mans Land, and Gay Head Lighthouse should be 15 miles distant when on the starboard beam. Beavertail and Point Judith lighthouses will be made on the starboard bow and Block Island and the lighthouses on it on the port bow.

MASSACHUSETTS BAY*

is the large and deep body of water indenting the eastern shore of Massachusetts, and, for the purpose of this description, may be considered as the waters lying to the westward of a line joining Cape Ann and Cape Cod. It is about 20 miles wide (E. and W.) and over 50 miles long (N. and S.).

From Cape Ann, the northern point of the bay, the shore line extends in a general SW. direction for about 20 miles to Nahant Head. That part making farther to the westward is known as Boston Bay (see description) and extends to the southward to Minots Ledge (lying about 11 miles S SE. from Nahant Head), from which the shore line extends in a S. by E. direction for about 20 miles; to the southward of this the shore line curves to the eastward and northward and this part of the bay assumes a semicircular shape and is known as Cape Cod Bay.

On the shores of Massachusetts Bay there are a number of sea-coast and harbor lights (see table, page 10) which make navigation of the bay comparatively easy in clear weather.

Bays and harbors.—Within the limits of Massachusetts Bay there are a number of bays and harbors, the most important of which, named in order from Cape Ann to the westward and southward, are Gloucester Harbor, Marblehead Harbor, Salem Harbor, Nahant Bay, and Boston Bay. Inclosed in the limits of the last-named bay are Broad Sound, Lynn Harbor, Boston Harbor, Hingham Bay, and Cohasset Harbor. Farther to the southward are Duxbury, Kingston, and Plymouth, and then Cape Cod Bay, with the small harbors of Barnstable, Wellfleet, and Provincetown. The above-mentioned harbors are treated of under separate headings.

Stellwagen Bank, in the entrance to Massachusetts Bay, lies almost exactly in line between Cape Ann and Cape Cod, is about 16½ miles long, 2½ miles wide at its northern end, and nearly 8 miles wide at its southern, and has from 9½ to 20 fathoms of water over it. The bank extends in a N. and S. direction, its northern end being a little over 15 miles to the southward of Cape Ann Lighthouses and its southern end 5 miles to the northward of Race Point. At its southwestern extremity, which is a little over 27 miles to the southeastward of Boston Lighthouse, is a spot with 9½ fathoms, the shoalest part of the bank; but the general depth over its area is from 12 to 15 fathoms.

Striking the northern part of this bank, in coming from the eastward, it will shoal rapidly from 30 to 19 fathoms; crossing the middle of the bank on a W NW. course, you will have from 14 to 16 fathoms, "coarse sand and black pecks;" and here the bank is a little over 4 miles wide. But in coming from the southward and crossing the southwestern end of the bank the soundings will decrease rapidly from 25 to 12 fathoms, "fine sand;" and a least depth of 10 fathoms may be encountered before leaving the bank.

Pilotage, quarantine, &c.—Extracts from the laws of Massachusetts, relating to pilots, pilotage, harbor control, and quarantine are given in Appendix I.

Wind signals of the U. S. Weather Bureau are shown at the places mentioned on page 20, and their meaning explained in Appendix II.

A list of **Life-Saving Stations** is given on pages 20-21.

A list of **Lighthouses** is given on pages 10-17.

Tides, see page 22.

Variation of the compass, see page 22.

GLOUCESTER HARBOR*

is nearly 5 miles southwestward of **Emersons Point**, the most eastern point of Cape Ann, and is formed by an arm of the bay indenting the southern shore of Cape Ann. The entrance is between Eastern Point on the east and a bluff rocky head, over 100 feet high, called **Norman Woe**, on the west. **Eastern Point** is the southernmost point of Cape Ann; on its western extremity is **Eastern Point Lighthouse** (see page 10), the guide to Gloucester Harbor. At the entrance the harbor is about 1 mile wide and continues about the same width for $1\frac{1}{2}$ miles to Tenpound Island, after passing which it is much narrower, the width between Fort Point and Rocky Neck being only 350 yards.

Southeast Harbor is the cove in the eastern part of Gloucester Harbor, to the northward of Black Bess Point and southward of Tenpound Island (marked by a lighthouse, see page 10). It has good anchorage in 3 to 5 fathoms of water.

Western Harbor is the cove, of semicircular shape, in the northern part of Gloucester Harbor, to the northward of Tenpound Island. It has good anchorage in from 2 to 4 fathoms, but is not much used. A part of the town of Gloucester is built on its northern shore.

Inner Harbor, the northeastern part of Gloucester Harbor, has many small coves of which no description need be given. It is irregularly shaped, about 1,100 yards long and 600 yards wide, and has a general direction about NE. by E. and SW. by W.

Gloucester Harbor is an important harbor of refuge, and is the most important fishing port of the United States. There is 4 to 7 fathoms of water in the outer harbor and 2 to 4 fathoms in the inner harbor.

The best anchorage in the outer harbor for vessels coming in for shelter or bound to Gloucester, is **Southeast Harbor**, which has clay bottom, good holding ground. This portion of the harbor is commonly known as **Pancake Ground**. Vessels anchor almost anywhere in the harbor, but the entrance to Harbor Cove must be left clear. Fishing nets, marked by buoys, generally occupy the inshore portion of Southeast Harbor in summer.

Wharves.—There are a number of wharves at Gloucester, a few of which have depths alongside of 10 to 16 feet. There are several public landings for small vessels; larger vessels have to pay wharfage.

Pilots will be found cruising off the entrance to the harbor and as far to the eastward as Thatcher Island. A stranger bound for the port usually takes one, making signal if not spoken, and standing off and on outside until boarded. Pilotage is compulsory for certain classes of vessels (see Appendix I).

Towboats can be obtained at the steamboat wharf, and generally go outside to meet large vessels sighted coming in; such vessels are usually towed in and out. The usual charges for towing are about as follows: For moving fishing vessels about the harbor, \$2; coasting vessels and freighters, \$5; for towing larger vessels, \$15 to \$25, according to distance.

Harbor regulations are given in Appendix I. There are no special harbor dues.

Quarantine regulations are established from time to time by the board of health of Gloucester, and are enforced under the direction of the board.

The **U. S. Marine Hospital** at Chelsea, Mass. (see heading Boston Harbor), is the one to which mariners from American vessels entitled to hospital treatment are sent from Gloucester.

Marine railways.—Gloucester has three marine railways, which are capable of taking out small vessels only, the limit of size being about 200 tons, net register tonnage. Boston is the nearest place where large vessels can be docked (see Boston Harbor).

Supplies.—Provisions and ship chandler's stores can be obtained; also bituminous coal in limited quantities for steamers, put on board either at the coal wharves or by lighters. Fresh water is supplied by water boats or may be taken in at the wharves. Most of the tugs working in this harbor carry fresh water to supply shipping.

The wind signals are displayed over the custom-house (see Appendix II).

Gloucester is on the line of the Boston and Maine Railroad and has also daily steamboat communication with Boston.

Ice seldom extends outside Tenpound Island, at the entrance to the Inner Harbor. The formations of ice in this harbor were extensive and of long duration during the winter of 1874-75, forming a most complete barrier to the progress of sailing vessels not having the assistance of towboats, from the 14th of January to the 4th of March, at which latter date a strong NE. gale had succeeded in clearing the harbor of a large portion of the obstruction. During this period steamers could only enter through a narrow channel kept open by the efforts of the towboats. The anchorages on both sides of the harbor were also closed during the existence of the formations with the exception of Lighthouse Cove (just inside Eastern Point), which could be reached at any time by sailing vessels, although their movements were much retarded by the ice, which extended some distance beyond the point but was not heavy enough to endanger the safety of vessels.

* Shown on charts 334, scale $\frac{1}{20,000}$, price, \$0.20; 109, scale $\frac{1}{80,000}$, price, \$0.60.

A whistling buoy is moored in 32 fathoms of water 3 1/2 miles SSE. from Eastern Point Lighthouse.

GLOUCESTER HARBOR—SAILING DIRECTIONS.

Tides.—The highest tides result when easterly and southeasterly gales occur at full and change. See tide table on page 20.

Tidal currents.—The tidal current does not to any great degree interfere with the movements of vessels, as it sets directly in and out of the harbor and its velocity is comparatively small. In the narrows, however, between Fort Point and Rocky Neck, the current is strong, especially at half ebb, and the current of ebb sets on to Black Rock. Vessels coming out on the ebb favor the northwestern side of the channel in passing between Fort Point and the spindle on this rock. The ebb current also sets on to Tenpound Island; the courses given in the sailing directions allow a sufficient berth, and if made good will lead safely by.

SAILING DIRECTIONS, GLOUCESTER HARBOR.

1. Approaching and Entering from the Northeastward.—Passing about $\frac{1}{2}$ mile to the southward of the Londoner, steer **SW.** by **W.** $\frac{3}{4}$ **W.**, about $5\frac{1}{2}$ miles, until up to the whistling buoy off Eastern Point; round the ^{whistling} buoy, leaving it on the starboard hand, and steer **N.** by **W.** $\frac{1}{2}$ **W.** until Tenpound Island Lighthouse bears **NE.** by **N.** (Eastern Point Lighthouse bearing about **SE.** by **E.**) Then follow directions under section 2, paragraphs I, II, or III, according to destination.

Remarks.—On the **SW.** by **W.** $\frac{3}{4}$ **W.** course, Eastern Point Lighthouse will be on the starboard bow and the whistling buoy should be made nearly ahead. When up to this buoy the harbor will be opened out to the northward and Tenpound Island Lighthouse will be seen bearing about **N.** by **E.**

The **N.** by **W.** $\frac{1}{2}$ **W.** course leads to the westward of Eastern Point Ledge buoy (red, No. 2), and Dog Bar buoy (red, No. 4) and to the eastward of Round Rock Shoal buoy (black, No. 1).

Dangers.—The Londoner is a ledge of rocks a little over $\frac{1}{2}$ mile long in a **NE.** and **SW.** direction and 350 yards wide, bearing **E SE.**, distant 800 yards from Cape Ann South Lighthouse. Its southern end is dry at low water and is marked by an iron spindle with octagonal cage on top.

Eastern Point Ledge, with a depth of 13 to 16 feet, makes off 375 yards to the southwestward from Eastern Point Lighthouse. It is marked off its end by a buoy (red, No. 2). **Webbers Rock**, with 8 feet over it, is on the end of the ledge, about 200 yards **E.** by **N.** from the buoy.

Dog Bar makes off to the westward from Eastern Point just above the lighthouse; it has 14 to 15 feet over its outer part with much less towards the shore. The end of the bar is $\frac{3}{4}$ mile **NW.** by **W.** from Eastern Point Lighthouse, and its southwestern side is marked by a buoy (red, No. 4).

Round Rock Shoal has $12\frac{1}{2}$ to 18 feet over it, is about 250 yards long in a **NE.** by **N.** and **SW.** by **S.** direction and about 150 yards wide. The shoal lies in the middle of the entrance, bearing **NW.** by **W.** $\frac{1}{4}$ **W.** distant $\frac{3}{4}$ mile from Eastern Point Lighthouse; its southeastern end is marked by a buoy (black, No. 1). About 400 yards **NNW.** $\frac{1}{4}$ **W.** from this buoy is a small detached rocky spot with 17 feet over it in a surrounding depth of 7 to 9 fathoms.

1 A. Approaching from the Southeastward or Southward.—When Eastern Point Lighthouse is made, steer so as to pass about $\frac{1}{2}$ mile to the southwestward of it; bring Tenpound Island Lighthouse to bear **NE.** by **N.** and run for it, keeping the bearing until abreast and about 250 yards to the eastward of Round Rock Shoal buoy, then follow the directions under section 2.

From the Whistling buoy, or
or, if Eastern Point whistling buoy is made, pass close to the southward of it and proceed as directed in section 1 foregoing.

Remarks.—Tenpound Island Lighthouse is not easily picked up in the daytime, as it is painted brown, and has a number of houses near it painted the same color.

See dangers under section 1 foregoing.

1 B. Approaching and Entering from the Southwestward or Westward.—Bring Eastern Point Lighthouse to bear to the northward of **NE.** by **E.** and steer for it.

or, if coming from Salem or Manchester Harbor, bring Baker Island Lighthouses to bear **W SW.** $\frac{3}{4}$ **W.** and steer **E NE.** $\frac{3}{4}$ **E.**

As Eastern Point Lighthouse is approached, the harbor will be opened out and **Norman Woe**, the western point of the entrance, will be seen. Change the course so as to pass about $\frac{1}{2}$ mile to the eastward of Norman Woe, and when the bell buoy, to the southeastward of Norman Woe Rock, is made, steer for it.

Pass about 300 yards to the eastward of the bell buoy and steer **NE.** $\frac{3}{4}$ **N.**; then:—

If bound to an anchorage in Southeast Harbor, when Eastern Point Lighthouse bears **SE.** steer **E NE.** and anchor in 4 to 5 fathoms when Tenpound Island Lighthouse bears about **N NW.** $\frac{1}{4}$ **W.**

If bound to an anchorage in *Western Harbor*, continue the **NE. $\frac{3}{4}$ N.** course until Tenpound Island Lighthouse bears about **S SE.** when anchor in $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms; or, when Tenpound Island Lighthouse bears about **E SE.** haul more to the northward and anchor in 3 to 5 fathoms anywhere in the harbor, but not within 300 yards of the shore.

If bound into the *Inner Harbor*, when Tenpound Island Lighthouse bears **E. $\frac{1}{2}$ S.**, steer **E NE.** and proceed as directed in paragraph III, section 2.

Remarks.—The **NE. $\frac{3}{4}$ N.** course into the harbor leaves Norman Woe Rock about 600 yards on the port hand, and Muscle Point and the shore just to the northward are given a berth of about 400 yards, but may be approached to within 200 yards with 4 to 7 fathoms. Tenpound Island Lighthouse will be a little on the starboard bow.

Dangers.—The dangers to the southward and eastward of Baker Island are described under the heading *Salem Harbor*.

Norman Woe Rock, a high and dark rocky islet, lies about 350 yards from the western shore. Shoal water makes from the rock to the shore, and a shoal with 7 to 16 feet over it extends nearly 300 yards in a **SE. by S.** direction and is marked at its outer limit by a black bell buoy. The long and shallow bight between the rock and the shore from Norman Woe to Muscle Point is known as **Norman Woe Cove**.

Round Rock Shoal is described on page 26. **Tenpound Island Ledge** is described below.

Field Rocks extend 450 yards from the northern shore of Fresh Water Cove abreast Tenpound Island Ledge; several of them are bare at low water, and their southern end is marked by a buoy (black, No. 3) lying nearly $\frac{1}{2}$ mile **W. $\frac{1}{2}$ S.** from Tenpound Island Lighthouse.

2. To an Anchorage.—Having followed the directions in sections 1 or 1A and having Round Rock Shoal buoy bearing about **W.** distant $\frac{1}{2}$ mile and Eastern Point Lighthouse bearing **SE.** by **E.** distant about $\frac{1}{2}$ mile:—

I. To anchor in Southeast Harbor.—Steer **NE.** and anchor in about 5 fathoms anywhere to the southward of Tenpound Island, giving its shores a berth of at least 200 yards, and the shore to the eastward and southeastward a berth of not less than 350 yards.

II. To anchor in Western Harbor.—Steer **N.** by **E. $\frac{3}{4}$ E.**, leave the two red buoys marking Tenpound Island Ledge 200 to 300 yards on the starboard hand and Field Rock buoy (black, No. 3) 300 to 600 yards on the port hand. When past these buoys steer a little more to the eastward, and when to the northward and westward of Tenpound Island anchor anywhere, in 3 to 5 fathoms, but not nearer than 300 yards to the shore. Light-draught vessels may anchor nearer the shore by using the lead as the northern shore is approached.

Dangers.—Round Rock Shoal is described on page 26.

Tenpound Island Ledge is a small ledge with 9 feet over it, lying 700 yards **SW. $\frac{1}{2}$ W.** from Tenpound Island Lighthouse. It is marked by two buoys, one (red, No. 6) on the western edge, the other (red, No. 6A) lying about 150 yards to the southward of the ledge.

Field Rocks are described above.

III. To the Inner Harbor.—Steer **NE.** by **N.**, on a bearing for Tenpound Island Lighthouse, and when Eastern Point Lighthouse bears **S. $\frac{1}{4}$ W.** steer **N. $\frac{1}{4}$ E.**, passing on this course at least 200 yards east of the two red buoys marking Tenpound Island Ledge and about 300 yards to the westward of Tenpound Island. When Tenpound Island Lighthouse bears **E SE.** steer **E NE.** and anchor abreast of the wharves in $3\frac{1}{2}$ to 4 fathoms of water when past Elisha Ledge buoy (red, No. 8).

Or, follow directions under paragraph II, until Tenpound Island Lighthouse bears **E.**, then steer **E NE.** up the harbor and anchor off the wharves as directed above.

Remarks.—The **N. $\frac{1}{4}$ E.** course leads between Tenpound Island Ledge and Tenpound Island; the upper buoy (red, No. 6) marks Tenpound Island Ledge on its western side, and should therefore be given a berth of about 200 yards.

On the **E NE.** course Babson Ledge buoy will be left on the port hand, and Black Rock spindle, off the western end of Rocky Neck, on the starboard hand. Fivepound Island, in the middle of the northeastern part of the inner harbor, will be on the port bow. Anchorage in 15 to 18 feet will be found 175 yards to the southward of this island.

See tidal currents on page 26.

Dangers.—Tenpound Island Ledge and Field Rocks are described above.

A ledge, with 10 feet over its outer end, makes out 150 yards in a **SW.** direction from the southwestern end of Tenpound Island.

Babson Ledge is a small spot with 14 feet over it about 500 yards **N. $\frac{1}{4}$ E.** from Tenpound Island Lighthouse and is marked by a buoy (black, No. 5).

Black Rock, dry at half tide, lies 100 yards from the western end of Rocky Neck and is marked by spindle (iron, red, oblong cage on top). Shoal water extends from here to the southward to the eastern side of Tenpound Island.

Elisha Ledge, dry at low water, lies off the north shore of Rocky Neck, and about **E NE.** from Black Rock spindle. It is marked off its northern side by a buoy (red, No. 8). The ledge lies about half way between the buoy and the end of the wharf just to the eastward.

MANCHESTER HARBOR.*

about 5 miles to the westward of Gloucester Harbor, is formed by an arm of the bay extending behind Gales Point in a northeasterly direction for 1 mile to the village of Manchester; the entrance being N. by E. from Baker Island Lighthouses, and the approach to it is between House Island on the east and Great Misery Island on the west. The western point at the entrance is a high, precipitous head, called Glass Head, and between this head and Gales Point the entrance is 600 yards wide. Proctor Point is on the eastern shore of Manchester Harbor, $\frac{1}{2}$ mile above Gales Point, and directly opposite to Glass Head, and the harbor here is not quite 200 yards wide.

There is anchorage off the entrance between Great Misery and House islands and the main shore to the westward of Glass Head. Mariners desiring to anchor for the night or in head winds may here find fair holding ground and good shelter except in southerly gales. The anchorage is $\frac{1}{2}$ mile wide, and has from 3 to 6 fathoms.

The narrow channel leading up to Manchester from the outer harbor is about 100 feet wide and $6\frac{1}{2}$ feet deep as far as Proctor Point, above which it is practically dry at low water. Improvements are being made under direction of the U. S. Engineers to obtain a channel 60 feet wide and 4 feet deep, at low water, from Proctor Point to the town wharves.

The draught of the vessels going to Manchester averages about 7 feet; deepest draught about 10 feet.

Pilots are usually taken by strangers bound up to the town, the vessels anchoring in the harbor below until pilots come down in response to signals.

Towboats can be had from Beverly, and are used in towing barges up and down.

Supplies.—Fresh water can be obtained at Manchester; supplies and ship chandler's stores from Salem and Beverly. The nearest custom-house is at Gloucester.

Tides.—The mean rise and fall of tides is about 9 feet. See also tidal data for Gloucester and Salem on page 22.

SAILING DIRECTIONS, MANCHESTER HARBOR.

Approaching and Entering to an Anchorage.—With Baker Island Lighthouses bearing between W SW. $\frac{1}{2}$ W. and NW. by W. $\frac{1}{2}$ W. steer for them. Pass about $\frac{1}{4}$ mile to the northward of Baker Island Lighthouses, and when they bear S. $\frac{1}{4}$ W. steer N. $\frac{1}{4}$ E., keeping the bearing and keeping the bell tower to the northward of the lighthouses between the two lighthouses. Leave Whaleback spindle on the starboard hand and Saulis Rock buoy (red and black horizontal stripes) on the port hand.

If intending to anchor in the roads, when past Saulis Rock buoy steer for Chubb Island (about N NW.), and anchor in about 5 fathoms, sandy bottom.

If bound to the village, when the top of the high wooded hill a little to the westward of Glass Head bears N. by E. $\frac{1}{2}$ E., steer for it. Anchor when the center of the southernmost of the two Ram islands (which has shrubs and small trees upon it) bears SE. There will then be 18 feet at low water, and no attempt should be made to go farther without a pilot.

Remarks.—When heading for Baker Island Lighthouses, as directed, all dangers will be cleared. On the N. $\frac{1}{4}$ E. course the spindle on Whaleback should be given a berth of 300 yards, and the buoy on Saulis Rock a berth of about 200 yards. Glass Head will be on the starboard bow and Chubb Island on the port bow. Be careful not to get the bell tower open to the westward of the lower lighthouse, or to the eastward of the higher lighthouse.

Chubb Island is a bare rocky islet lying off the main shore, in the outer roads, about $\frac{1}{2}$ mile to the westward of Glass Head.

Dangers.—Off the shore to the eastward of Manchester Harbor entrance and between Gloucester entrance and House Island are a number of islands, rocks, and ledges, the principal ones of which, named in order from the eastward, are: Kettle Island, Great Egg Rock, Graves Island, Salt Rock, Little Egg Rock, Picketts Ledge, Gales Ledge, and Pilgrim Ledge. The dangers mentioned, with exception of Gales Ledge and Pilgrim Ledge, are bare at low water. *Boo-hoo Ledge, a small rocky ledge with 4 ft. water over it, 350 yards SSW $\frac{1}{2}$ E from Salt Rock*

Gales Ledge, 1 mile NE. by E. $\frac{1}{2}$ E. from Baker Island Lighthouse, is marked by a buoy (red, No. 2) and has a least depth of 4 feet over it. *It shall spot with 10 ft. water over it lies about 385 yards N $\frac{1}{2}$ E from Gales Ledge*

Pilgrim Ledge lies 400 yards west of Gales Ledge and has a depth of $3\frac{1}{2}$ fathoms.

The sailing directions lead well clear of these dangers.

Whaleback is a dangerous ledge lying directly in the passage into the harbor, being less than $\frac{1}{2}$ mile SW. by S. from House Island and about $\frac{1}{2}$ mile E. from Great Misery Island. It is about 400 yards long in a NNE. and SSW. direction and 75 yards wide, and is bare at low water at the middle and near its northern end. A red iron spindle, with cage on top, marks the ledge near its center.

Saulis Rock lies 300 yards E. from the northeastern point of Great Misery Island; it has a least depth of 2 feet and is marked by a buoy (red and black horizontal stripes).

* Shown on Charts 335, scale $\frac{1}{25,000}$ price \$0.40; 109, scale $\frac{1}{80,000}$ price \$0.50.

SALEM HARBOR.*

This harbor is at the western end of a large, irregular indentation in the shore of Massachusetts Bay, and is situated 11 miles to the southwestward of Cape Ann, and 12 miles to the northward and eastward of Boston Harbor entrance. **Gales Point** is the northern point, and **Marblehead Neck** the southern point at the entrance to this large indentation, which may be said to include within its limits the harbors of Manchester, Beverly, Salem, and Marblehead, the distance between the two points being 4 miles. This wide space is studded with islands, bare rocks, and sunken ledges, through which lead the several channels into the harbors.

Inside of the islands and rocks obstructing the entrance, and to the southward of the northern shore line, there is good anchorage in what may be properly termed the outer harbor. This anchorage ground is about 2 miles long (E. and W.) and from $\frac{1}{2}$ to $1\frac{1}{4}$ miles wide (N. and S.).

The **Inner Harbor**, or Salem Harbor proper, lies between Marblehead Peninsula on the east and Salem Neck and the neck of land to the southward of it on the west. Within these limits its direction is about NE. by N. and SW. by S., and it is $1\frac{1}{2}$ miles long. The entrance is between Fort Pickering Lighthouse on the northwest and **Naugus Head**, the northwestern point of Marblehead Peninsula, on the southeast. Between these two points it is 700 yards wide, but it rapidly widens, after passing Naugus Head, to a width of nearly 1 mile.

The deep-water channel, 3 to 4 fathoms, is quite narrow and lies nearest to the eastern shore; extensive flats make off from the western or town side.

Forest River, a small shallow stream, flows into the southern end of the harbor.

Salem is separated from South Salem by **South River**, a shallow stream 50 yards wide between the wharf lines of the two, but which widens into a broad lagoon, separating the South Salem Peninsula from the mainland to the westward. At the mouth of this stream stretches a very long wharf (covered with warehouses) which runs about SE., is nearly 600 yards long, and is called **Derby Wharf**. On the end of this wharf is **Derby Wharf Lighthouse**; this with Fort Pickering Lighthouse forms a range for approaching the Inner Harbor.

Salem Harbor is much used as a harbor of refuge, particularly during the autumn. It is especially convenient for vessels seeking shelter bound to the eastward and met by an easterly gale, as the direction of the harbor is such that a foul wind for proceeding is a fair wind into the harbor, and a fair wind for proceeding is also a fair wind out.

Strangers should not attempt to beat into Salem Harbor on account of the numerous ledges and shoals.

Salem has some trade by water. The deepest draft of vessels entering the harbor is 20 feet. There is a depth of 15 feet alongside the Pennsylvania Pier and of 5 to 8 feet alongside Derby and Phillip wharves.

Prominent Objects.—Approaching from the eastward **Baker Island** (with two lighthouses on its northern end, see table page 10) and **Great Misery Island**, the high bare island to the northward of it, will be most prominent. To the westward of these islands is Bowditch Ledge beacon, a large granite structure with black staff and cage on top.

Hospital Point Lighthouse (see table page 10) is on the north shore nearly $3\frac{1}{4}$ miles WNW. from Baker Island Lighthouses and is the guide for standing in from the eastward. On the north side of the entrance to the Inner Harbor is **Fort Pickering Lighthouse**. Approaching from the southward **Halfway Rock**, a high, solitary rock, with a beacon on it, will be seen about $1\frac{1}{4}$ miles south of Baker Island. To the southward of Baker Island lie two bare rocky islets, **North** and **South Gooseberry Islands**, and $1\frac{1}{4}$ miles SW. of these is **Cat Island**, long and narrow with a large yellow hotel, surmounted by a small cupola, near the middle of the island.

Marblehead Neck is high and rocky and has many summer houses near its end; these obscure Marblehead Lighthouse on certain bearings when coming from the southwestward.

Channels.—Three principal channels lead into Salem Harbor, which are equally good for entering in the daytime in clear weather. These channels come together in the outer harbor, to the northward of Little Haste, and from there into Salem Harbor proper the depth is $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms.

Main Ship Channel, the most northern channel, has a least depth of over 5 fathoms, its entrance lies between Baker Island and Great Misery Island and its general direction is about WNW.

Cat Island Channel, the middle channel, having its entrance near Halfway Rock, leads in a northwesterly direction, between Cat Island to the southward and Eagle Island to the northward and has a least depth of about 5 fathoms.

Marblehead Channel, the western channel, leads, in a northerly direction, between Cat Island and Marblehead, and has a least depth of about 4 fathoms. It and Cat Island Channel are also channels for approaching the entrance to Marblehead Harbor.

South Channel, a branch from Marblehead Channel, leads along the northern shore of Marblehead Peninsula and to the southward of the numerous rocks and ledges lying to the eastward of the immediate entrance to Salem Harbor, and to the southward and eastward of the main channel. The depth at mean low water in the South Channel is about 9 feet.

* Shown on charts 335, scale $\frac{1}{25,000}$, price \$0.40; 109, scale $\frac{1}{80,000}$, price \$0.50. See also footnote on page 9.

Anchorage.—There is good anchorage in 5 to 7 fathoms to the westward of Bowditch Ledge and to the northward or eastward of Little Haste (see description of the harbor on page 29). The anchorage for vessels entering the port and subject to quarantine lies within the following limits: Beginning at Eagle Island and running northwesterly to Coney Island, from Coney Island in a more northerly direction to Great Haste, from there easterly to Bowditch Ledge, and thence southwesterly to Eagle Island. In Salem Harbor the best anchorage is just inside of Naugus Head on the eastern side of the harbor.

Pilots will be found outside of Baker Island. A stranger bound for the port usually takes one, making signal if not spoken, and standing off and on outside until boarded. Pilotage is compulsory for certain classes of vessels in the ports of Massachusetts (see Appendix I).

Towboats can be obtained by making signal after getting in past Baker Island, but are not much used.

Quarantine regulations are established from time to time by the Board of Health of Salem. For anchorage of vessels subject to quarantine see "Anchorages."

There is a **U. S. Marine Hospital** relief station at Salem; the nearest Marine Hospital is at Chelsea, Mass. (see Appendix III).

Supplies, provisions, and ship chandler's stores can be obtained. Coal, either anthracite or bituminous, can be obtained at Phillip Wharf. Water can be had through hose alongside the wharves.

Marine Railway.—There is one small marine railway at South Salem, with a cradle 75 feet in length.

The **prevailing winds** are easterly in summer, westerly in winter. The strongest winds are generally northwesterly or southwesterly.

Fog.—There is very little fog; it is sometimes brought in by easterly winds and is cleared away by westerly winds.

Ice.—That portion of the Inner Harbor of Salem lying above Phillip Wharf is usually closed by ice every winter during the months of January and February; but the formations rarely extend beyond this point except in unusually severe winters, when they have been known to reach as far out as The Haste, and occasionally as far as Eagle Island. This island has always been considered as marking the extreme limits of the ice, but the winter of 1874-'75 was an exception to the rule. During this very cold winter the formations reached The Haste about the 15th of February, and on the 21st of that month no open water could be seen inside of Baker Island. The movements of sailing vessels were considerably delayed from about the 15th of January to the 26th day of February; and from the 15th to the 26th of the latter month the Inner Harbor was closed to vessels of every description. The formations in the approaches broke up as far as Fort Pickering on the 23d, and as far as Phillip Wharf on the 26th of February; but above this last-mentioned point the ice did not finally disappear until the latter part of March.

Northerly and northwesterly winds are most favorable to local formations in Salem Harbor. Winds from the southward and westward, during light formations, have a tendency to carry the ice off to sea, while those from NE. to SE. create a swell which usually breaks up the formations both in the harbor and its approaches.

Tides (see page 22).

The **tidal currents** in Salem Harbor are very weak, and mariners will generally be able to make their course good without regard to tide.

For variation of the compass at various points, see page 22.

SAILING DIRECTIONS, SALEM HARBOR.

1. Approaching from the Eastward and Entering by the Main Ship Channel.—When Baker Island Lighthouses are made steer for them on any bearing between W SW. $\frac{1}{2}$ W. through W. to NW. by W. $\frac{1}{2}$ W. Pass about 400 yards to the northward of the lighthouses and steer WNW. $\frac{1}{4}$ W. for Hospital Point Lighthouse, and when Bowditch Ledge beacon bears about S., distant 200 yards, steer W. $\frac{1}{2}$ N. until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range bearing SW. by W. $\frac{1}{4}$ W. Then follow the directions in section 2.

At Night.—Follow the directions above and when on the WNW. $\frac{1}{4}$ W. course for Hospital Point Light continue on that course until Fort Pickering and Derby Wharf lights are in range. Then follow the directions in section 2. When on the sailing line for Hospital Point Light, the light will show brighter than if to the northward or southward of the line. Keep in the brightest rays of that light.

Remarks.—When standing for Baker Island Lighthouses, Great Misery Island, a large hilly island, and Little Misery will be seen to the northward of Baker Island. When passing north of Baker Island, Bowditch Ledge beacon, a large conical stone structure surmounted by a black wooden staff and cage, will show prominently.

Hospital Point Lighthouse is on the north shore near the entrance to Beverly Harbor; it should be kept ahead while on the W NW. $\frac{1}{4}$ W. course, and the buoys to the westward of Great Misery Island should be left on the starboard hand.

On the W. $\frac{1}{2}$ N. course Beverly Harbor entrance will be ahead; **Great Haste**, a low, bare, rocky islet, and **Little Haste** beacon, a black oak spar with cask on top, will be on the port bow. **Fort Pickering Lighthouse** will be seen on the western side of Salem Harbor entrance and **Derby Wharf Lighthouse** on the end of the wharf, 1 mile to the southwestward of it.

Derby Wharf Lighthouse is hard to pick up in the daytime as it is small and brick color, and about the same color as the buildings showing back of it.

Dangers.—**Gales Ledge** is described on page 28.

Outer or Southeast Breakers, with 4 to 17 feet over them, lie about $1\frac{1}{2}$ miles S SE. $\frac{1}{2}$ E. from Baker Island Lighthouses and are marked off the southern end by a buoy (red, No. 2); this buoy is numbered and colored for the vessels passing into the Cat Island Channel.

Middle Breakers, partly bare at low water, lie $1\frac{1}{2}$ miles SE. by S. from Baker Island Lighthouses and are marked by a spindle (iron, black ring and pendants on top).

Inner Breakers, showing bare at low water, lie $\frac{1}{2}$ mile W NW. from the spindle on Middle Breakers. From Inner Breakers shoal ground extends to the northwestward nearly to Baker Island.

Searle Rock, with 8 feet over it, lies about $\frac{1}{2}$ mile SE. $\frac{1}{2}$ S. from Baker Island Lighthouses and is marked on its northern side by a buoy (black, No. 1).

Two spots, with 16 and 18 feet over them respectively, lie $\frac{1}{2}$ mile N. by E. $\frac{1}{2}$ E. from the spindle on Middle Breakers and about $1\frac{1}{2}$ miles SE. $\frac{1}{2}$ E. from Baker Island Lighthouses. They are avoided by keeping the lighthouses bearing to the westward of NW. by W.

Whaleback, marked by a spindle (red cage on top), is described on page 28.

Baker Island Shoal extends to the northwestward about 300 yards and to the westward about 600 yards from the northern end of Baker Island. The northern edge of this shoal is marked by a buoy (black, No. 3).

Hardy Rock Shoal, **Hardy Rocks** and **Rising States Ledge** lie to the southward of House Ledge and W. from the northern end of Baker Island. They are marked by two buoys (black, Nos. 5 and 7) and by a beacon (spar with two triangles on top).

House Ledge has 10 feet over it and lies about $\frac{3}{4}$ mile E SE. $\frac{1}{2}$ E. from Bowditch Ledge beacon; it is on the south side of the Main Ship Channel and is marked by a buoy (red and black horizontal stripes) placed off its northeastern side.

Bowditch Ledge has 5 feet over it and lies on the south side of the Main Ship Channel about $1\frac{1}{2}$ miles W NW. from Baker Island Lighthouses; it is marked by a beacon (granite, conical structure with black wooden staff and cage on top). A shoal spot, with 15 feet, in a surrounding depth of 4 to 5 fathoms, lies 200 yards E SE. $\frac{1}{2}$ E. from the beacon.

Misery Ledge is small, has 10 feet over it, lies on the north side of the Main Ship Channel $\frac{1}{2}$ mile N. by E. $\frac{1}{2}$ E. from Bowditch Ledge beacon, and is marked on its southern side by a buoy (red and black horizontal stripes).

John Ledge has 10 feet over it, lies about 300 yards W NW. $\frac{1}{2}$ W. from Misery Ledge and is marked off its southern side by a buoy (red and black horizontal stripes).

Misery Shoal, with 7 feet over it, and **Misery Rock**, with 6 feet over it, lie to the westward from Great Misery Island and to the northward and northeastward from Misery Ledge, and are both marked by buoys.

Great Haste is a low, bare, rocky islet surrounded by ledges and lies $2\frac{1}{2}$ miles W. $\frac{1}{2}$ N. from Baker Island Lighthouses and nearly 1 mile S SE. $\frac{1}{2}$ E. from Hospital Point Lighthouse.

Little Haste, a rock, bare at low water, lies to the northwestward of Great Haste and is marked by a black beacon with cask on top.

Haste Shoal makes off about 300 yards to the northward from Little Haste and is marked near its northern end by a buoy (black, No. 11).

A small shoal spot having a depth of 17 feet over it, lies 300 yards about N. $\frac{1}{2}$ E. from buoy No. 11 and on the range of Little Haste beacon and Marblehead Rock beacon. The sailing line leads to the southward of this shoal.

Haste Rock has 8 feet over it, lies near the eastern end of the ledge making to the eastward from Great Haste, and is marked off its eastern side by a buoy (black, No. 7).

1 A. *Approaching from the Southward or Southeastward and Entering by the Cat Island Channel.*—When Halfway Rock is made, steer for it on any bearing between W SW. (through W. and N.) and NE. by E. Give the rock a berth of from 250 yards to $\frac{1}{2}$ mile and bring it to bear SE. $\frac{3}{4}$ E. and steer NW. $\frac{3}{4}$ W. until Eagle Island is in range with the northern end of Baker Island bearing about E NE. and Marblehead Lighthouse is on the port beam. Then steer N. by W. $\frac{1}{2}$ W. until Hospital Point Lighthouse bears NW., when steer for it on that bearing until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range bearing SW. by W. $\frac{1}{2}$ W., then follow the directions in section 2.

At Night.—Unless the night is clear, so that the buoys can be seen, a stranger should enter by the Main Ship Channel (see section 1).

Remarks.—**Halfway Rock**, lying in deep water off the entrance to this channel, is a prominent bare rock rendered very conspicuous by a pyramidal frame beacon with stone foundation; on the top of the pyramid is a red keg. The nearest dangers are a little over $\frac{1}{2}$ mile to the northward and northeastward from it.

On the NW. $\frac{1}{2}$ W. course **Coney Island**, low, bare, rocky islet, will be ahead; **Gooseberry Ledge** buoy, **Brimbles spindle** and **Mid-channel Rock** buoy will be left on the starboard hand in the order named, and **Satan spindle**, **Martin Rock** buoy, and **Chappel Ledge** buoy on the port hand.

Eagle Island is a small, bare, rocky island about $\frac{1}{2}$ mile **NNE. $\frac{1}{2}$ E.** from the northern end of **Cat Island**. The latter island can be readily distinguished by a large hotel; it lies about $\frac{1}{2}$ mile **E NE.** from the northern end of **Marblehead Neck**.

On the **N. by W. $\frac{1}{2}$ W.** course two black buoys will be left about 350 yards on the port hand; **Great Haste**, a low, bare, rocky islet, and **Hospital Point Lighthouse** will be on the port bow.

On the **NW.** course for **Hospital Point Lighthouse** the buoys and beacon which are left on the port hand should be given a berth of 350 yards. **Salem Harbor** will be open to the southwestward, and **Fort Pickering** and **Derby Wharf** lighthouses will be seen on the western side of the harbor.

Dangers.—**Southeast Breakers** are described under section 1.

Davis Ledge, with 12 feet over it, lies $1\frac{1}{2}$ miles **S.** from **Baker Island Lighthouses**.

A large shoal, showing dry ledges in places, about $1\frac{1}{2}$ miles wide **E.** and **W.**, extends nearly 1 mile to the southward of **Baker Island**. The **Inner Breakers** form its southeastern extremity, and near its southern end are the **Dry Breakers** lying about 400 yards **N NW.** from **Davis Ledge**. Near its western end are the small islands of **North Gooseberry** and **South Gooseberry**.

Gooseberry Ledge is small and has a depth of 14 feet; it lies on the north side of the **Cat Island Channel** about $1\frac{1}{2}$ miles **NW. $\frac{1}{2}$ N.** from **Halfway Rock** and is marked by a buoy (red and black horizontal stripes).

Satan Rock is a small bare rock marked by a red spindle with black cage on top; it lies about $\frac{1}{2}$ mile **E. $\frac{1}{2}$ S.** from **Cat Island** beacon and should be given a berth of 150 yards.

Martin Rock has 12 feet over it, and lies about 350 yards **E.** from the northern end of **Cat Island**; it is marked on its eastern side by a buoy (black, No. 1). The eastern shore of **Cat Island** to the southward of this buoy should be given a berth of 200 yards.

The **Brimbles** are partly bare at low water and lie nearly $\frac{3}{4}$ mile **SE.** by **S.** from **Eagle Island** on the north side of **Cat Island Channel**, and are marked by a spindle (iron, with 4 arms; the two arms facing the **Cat Island Channel** are red); the ledge is about 300 yards long in a **N.** and **S.** direction and about 150 yards wide.

Mid-channel Rock has 16 feet over it, and lies about 425 yards **W SW. $\frac{1}{2}$ W.** from the western end of **Eagle Island**. It is marked off its western side by a buoy (red, No. 4).

Chappel Ledge has 15 feet over it, is about 100 yards in diameter, and lies $\frac{1}{2}$ mile **NW. $\frac{1}{2}$ N.** from the northern end of **Cat Island** and is marked by a buoy (red and black horizontal stripes) placed near its southeastern side.

Eagle Bar is an extensive shoal making off for a distance of over $\frac{3}{4}$ mile to the northwestward from **Eagle Island**; it is marked off its northwestern end by a buoy (red, No. 6).

Coney Ledge, showing a number of bare rocks at low water, makes off to the southeastward from **Coney Island**. It is marked near its eastern side by a buoy (black, No. 3).

Coney Island Rock is a detached rock, with 13 feet over it, lying about 300 yards **NE. $\frac{1}{2}$ E.** from **Coney Island**. It is marked at its eastern side by a buoy (black, No. 5).

Haste Rock, lying about 600 yards **N.** from **Coney Island**, **Great Haste**, **Little Haste**, and **Haste Shoal** are described under section 1.

1 B. *Approaching from the Southward or Southwestward and Entering by Marblehead Channel.*—With **Minots Ledge Lighthouse** bearing **S. $\frac{3}{4}$ E.** steer **N. $\frac{3}{4}$ W.**

or, with **Boston Lighthouse** bearing **S SW. $\frac{5}{8}$ W.** steer **N NE. $\frac{5}{8}$ E.**

or, with **Long Island Head Lighthouse** bearing **SW. $\frac{1}{8}$ W.** steer **NE. $\frac{1}{8}$ E.**

or, with **Egg Rock Lighthouse** bearing **W SW. $\frac{1}{2}$ W.** steer **E NE. $\frac{1}{2}$ E.**

Any of the above courses will lead up to the red bell buoy just to the eastward of **Outer Breakers**, and $1\frac{1}{4}$ miles **S.** by **W. $\frac{1}{2}$ W.** from **Tinker Island**. When up to the bell buoy the large hotel on **Cat Island** (to the northeastward of **Marblehead Neck**) will show prominently.

Bring the hotel to bear **N NE.** and steer for it until **Marblehead Rock** beacon is made, then change the course to the northward, so as to pass about 200 yards to the eastward of this beacon.

When **Marblehead Rock** beacon bears **W.**, distant about 200 yards, steer **N.** Leave **Archer Rock** and **Chappel Ledge** buoys each about 200 yards on the starboard hand and **Grays Rock** the same distance on the port hand.

Continue the **N.** course, passing well to the eastward of two black buoys, and when **Hospital Point Lighthouse** bears **NW.** steer for it on the bearing until **Fort Pickering** and **Derby Wharf** lighthouses are in range, bearing **SW.** by **W. $\frac{1}{4}$ W.**, then follow the directions in section 2.

If desiring to enter by the South Channel; When **Marblehead Rock** bears **W.**, distant 200 yards, follow the directions in section 2 A.

At night vessels should not attempt to enter by the **Marblehead** or **South Channels**.

Remarks.—The courses given, leading up to the bell buoy, lead clear of dangers. **Egg Rock Lighthouse** should not be brought to bear to southward of **W SW. $\frac{1}{4}$ W.** in order to avoid the dangers lying to the northward of the line joining it and the bell buoy, and which are described in treating of **Nahant Bay**.

On the **N NE.** course **Roaring Bull**, **Tinker Island**, and **Tom Moore Rock** will be left about $\frac{1}{4}$ mile on the port hand.

On the **N.** course **Archer Rock** and **Chappel Ledge** buoy, are left about 200 yards on the starboard hand and **Grays Rock** about the same distance on the port hand.

Dangers.—Outer Breakers have 8 feet over them, and lie a little over 3 miles ENE. from Egg Rock Lighthouse and about $1\frac{1}{2}$ miles to the southward of the southern end of Marblehead Neck; they are marked off their southeastern side by a red bell buoy. To the northwestward of this buoy lie Southwest Breakers, Great Pig Rocks, Dolphin Rock, Middle Ground, Sammy Rock, Ram Island, and Little Pig Rocks, extending in a broken line to the shore. Most of them are marked by buoys which are colored and numbered for vessels bound to the westward. There is a channel about $\frac{1}{2}$ mile wide between Great Pig Rocks on the south and Dolphin Rock and Middle Ground on the north.

Roaring Bull, a ledge bare at low water, lies about 400 yards SW. by S. from Tinker Island, the small island lying nearly $\frac{1}{2}$ mile S. from the southern end of Marblehead Neck. A spindle (iron, red, cross on top) marks the ledge. The eastern shores of Tinker Island should be given a berth of 200 yards, and vessels should not pass between the island and Marblehead Neck.

Tom Moore Rock shows bare at $\frac{1}{2}$ ebb and lies a little more than 350 yards to the eastward from the eastern shore of Marblehead Neck and about $\frac{1}{2}$ mile SSW. $\frac{1}{4}$ W. from the beacon on Marblehead Rock. It is marked by a spindle (iron, black, cask on top). There is shoal water between the spindle and the shore.

Marblehead Rock is a high bare rock surmounted by a beacon painted white and black in horizontal stripes, and lies about 500 yards to the eastward of the northeastern end of Marblehead Neck. It is bold-to on its eastern side.

Lasque Ledge, with a least depth of 6 feet over it, extends 350 yards in an easterly direction from the northern end of Marblehead Neck, and is marked at its end by a buoy (black, No. 1).

Archer Rock is a detached rock, with 10 feet over it, lying about 550 yard W. from the northern end of Cat Island. It is marked off its southern end by a buoy (red and black horizontal stripes).

Ledges and shoals make off nearly 300 yards to the westward from the northern half of Cat Island. On the ledges making off to the southward from the island is a beacon (black, with large cask on top). Shoal water extends 150 yards to the southward of the beacon. About 300 yards SW. from this beacon is a detached 17-foot spot.

Chappel Ledge is described under section 1 A, page 32.

Grays Rock is a low, bare rocky islet surrounded by shoal water for a distance of 125 yards; it lies about $\frac{1}{2}$ mile N. by E. $\frac{1}{4}$ E. from Marblehead Lighthouse. To the westward of Grays Rock is the entrance to the South Channel.

Coney Ledge and **Coney Island Rock** are described under section 1 A.

Haste Rock, **Great Haste**, **Little Haste** and **Haste Shoal** are described under section 1, page 31.

2. To an Anchorage in the Inner Harbor.—Having followed the directions in section 1, 1A, or 1B, steer for Fort Pickering Lighthouse, keeping it in range with Derby Wharf Lighthouse. When *Old Hospital Point*, the northern point of Salem Neck, bears NW. $\frac{1}{2}$ W., steer SW. $\frac{1}{4}$ W. passing 200 to 300 yards to the eastward of Fort Pickering Lighthouse; continue this course until inside of a line from Naugus Head to Fort Pickering Lighthouse, when anchor in $3\frac{1}{2}$ to 4 fathoms, soft bottom, to the southward of Fort Pickering Lighthouse, and about E. of Derby Wharf Lighthouse, giving the shore a berth of at least $\frac{1}{4}$ mile.

Remarks.—When standing for Fort Pickering Lighthouse the beacon on Abbott Rock will be on the starboard bow. When the course is changed to SW. $\frac{1}{4}$ W. Middle Ground buoy (black, No. 13) will be left about 150 yards on the port hand. Great Aqua Vitæ beacon, and the buoys marking the South Channel, will be seen on the port hand when nearly up to Fort Pickering Lighthouse. The sailing line leads about midway between Naugus Head and the coal wharf. The best anchorage is about 600 yards from the eastern shore of the harbor.

Dangers.—The **Middle Ground** extends $\frac{1}{2}$ mile in a SW. by W. $\frac{1}{4}$ W. direction from Great Haste to Great Aqua Vitæ Ledge; it is awash in several places at low water, and is marked at its western side by a buoy (black, No. 13).

Abbott Rock shows bare at low water and lies nearly 600 yards NE. $\frac{1}{4}$ E. from Fort Pickering Lighthouse; it is marked by a beacon (pyramidal stone structure, surmounted by a staff with square red cage on top). Shoal water extends nearly 200 yards to the southward from the beacon and an 18-foot shoal lies 250 yards NE. from it.

Great Aqua Vitæ Ledge lies about $\frac{1}{2}$ mile E. by S. from Fort Pickering Lighthouse and at the southwestern end of the Middle Ground, and is marked by a beacon (pyramidal stone structure surmounted by a black staff and cage).

Knapp Rock has 8 feet over it and lies about 200 yards to the westward from Great Aqua Vitæ Ledge; it is marked by a buoy (red, No. 10), which is left on the port hand by vessels entering from the northeastward.

Half Tide Rock lies nearly 300 yards SW. $\frac{1}{4}$ W. from Fort Pickering Lighthouse and is marked off its southern side by buoy (red, No. 12).

2 A. Through the South Channel to the Anchorage.—Follow the directions in section 1 B until Marblehead Rock bears W. distant about 200 yards; then steer N. by W. $\frac{1}{4}$ W. with Hospital Point Lighthouse ahead. The spindle on Kettlebottom should be kept a little on the port bow. Pass about 250 yards to the westward of Grays Rock and midway between Kettlebottom spindle (iron, black, with open sphere on top) and Williams Rock buoy (red, No. 2) to the northeastward of it. When midway between these steer NW., heading so as to pass midway between red buoy No. 4 and black buoy No. 3. When midway between these buoys, steer WNW. $\frac{1}{4}$ W.; on this course black buoy No. 5 should be left about 75 yards on the port hand, and red buoys Nos. 6, 8, and 10 should be left on the starboard hand. When the latter buoy is abeam steer about WSW. and anchor off the end of the coal wharf or when Derby Wharf Lighthouse bears W.

Remarks.—The buoys are the principal guides for this channel; they can be readily followed in the daytime in clear weather, being so close to each other that the next buoy ahead can always be seen.

A detailed description of the dangers on both sides of this channel would be of no practical use; Chart No. 335 should be examined to obtain an idea of their number and extent.

BEVERLY HARBOR.*

This small harbor lies north of Salem Neck, at the western end of Salem outer harbor, and is formed by the confluence of **Essex Branch** (locally known as **Danvers River**), **Beverly Creek** (**Bass River**), and **North River**, three small streams which unite at this point, forming a basin of irregular shape. On the northern shore of the basin is the town of **Beverly**. The harbor is about $\frac{1}{2}$ mile in diameter, full of flats and shoals, but with good water in the channel. It is crossed at its western end by two drawbridges (width of draws $32\frac{1}{2}$ and 40 feet). **Hospital Point Lighthouse** is the principal guide to the entrance, which is narrow and full of shoals.

The channel is marked by buoys and beacons, and it is claimed that 15 feet can be taken in at low water, but a stranger should not attempt to enter at low water if drawing over 10 feet. The deepest draught of vessels entering the harbor is about 17 or 18 feet. From 12 to 16 feet of water is found at the ends of wharves at low water.

The best anchorage is between the **Middle Ground** and **Lobster Rock** beacon, or between the bridge and wharves. In going up toward the bridge the best water is nearest the wharves. There is a public landing near the bridge.

Danversport, about $1\frac{1}{2}$ miles above Beverly, on **Danvers River**, is at the head of navigation. Vessels of 10 to 12 feet draught go up to **Danversport**.

North Salem, on the **North River**, is about 1 mile above Beverly. The greatest draught of vessels going to **North Salem** is about 10 to 12 feet.

Pilots will generally be found off **Baker Island**, and are generally taken by strangers. A vessel desiring a pilot, and not having been boarded by one off **Baker Island**, should come to anchor, with signal flying, when past **The Haste**, and wait for one to come on board. Pilotage is compulsory for certain classes of vessels (see Appendix I).

Towboats are frequently taken by vessels bound to Beverly, and can be had at the wharves, or by signaling for one when approaching the entrance of the harbor.

The quarantine ground is the same as for **Salem Harbor** (see page 30).

There is no **Marine Hospital** nearer than **Chelsea, Mass.** (see heading, **Boston Harbor** and Appendix III).

Supplies.—Provisions and ship-chandler's stores can be obtained, also anthracite and bituminous coal in limited quantities, for steamers, put on board alongside wharves or in lighters. Water can be obtained alongside wharves through pipes and hose, and is sometimes supplied by a tug.

Marine Railway.—There is one marine railway, capable of hauling out vessels of about 500 tons.

For prevailing winds, fogs, and ice see heading **Salem Harbor**.

Tides.—The mean rise and fall of tides are about the same as at **Salem** (see table, page 22).

The **Tidal Current** is strong, and sets athwart the channel in places; during the first half of the ebb it sets across **Monument Bar**.

SAILING DIRECTIONS, BEVERLY HARBOR.

Strangers of over 12 feet draught should not enter without a pilot, as the channel is narrow and crooked in places, and, although well marked by aids, requires some local knowledge to keep in the best water. No attempt to enter should be made at night.

1. **Approaching and Entering.**—Follow the directions in sections 1, 1A, or 1B, Sailing Directions, **Salem Harbor**. When **Fort Pickering** and **Derby Wharf Lighthouses** are in range steer about **WSW.**, and bring **Little Haste** beacon or the northern end of **Great Haste** to bear **SE.** by **E.** $\frac{1}{2}$ **E.**, and steer **NW.** by **W.** $\frac{1}{2}$ **W.**, keeping the beacon or island astern. When **Monument Bar** beacon (pyramidal stone structure with black staff and square cage on top) is in range with **Lobster Rock** beacon (square stone structure) and bearing about **W.**, steer **W.** by **N.** Leave black buoy No. 1, about 100 yards on the port hand, and pass about 75 yards to the northward of **Monument Bar** beacon. Round the beacon at this distance and steer about **SSW.**, heading about midway between **Ram Horn** beacon and red buoy No. 6, and so as to pass at least 100 yards to the eastward of red buoy No. 4; when abreast this buoy haul a little to the westward and pass about 50 yards to the eastward of red buoy No. 6. When this buoy is passed steer for **Lobster Rock** beacon; course about **NW.** $\frac{1}{2}$ **W.** When the beacon is about 150 yards distant ahead, haul to the northward,

* See footnote on page 22.

pass about midway between the beacon and Tuck Point (Sand Point) and anchor off the wharves of the town in about 18 feet water, soft bottom.

Remarks.—On the NW. by W. $\frac{1}{2}$ W. course Porter Rock buoy (red, No. 2) will be made ahead; this buoy is left on the starboard hand when rounding Monument Bar beacon. The shoalest water in the channel is abreast of red buoy No. 4, which should be given a good berth.

Dangers.—Shoal water extends from Old Hospital point to the northward $\frac{1}{2}$ mile, and nearly that distance to the westward; the shoal is marked at its northern limit by a buoy (black, No. 1), near its northwestern end by Monument Bar beacon, and on its western side by Ram Horn beacon.

Shoal water extends $\frac{1}{2}$ mile in a southeasterly direction from Tuck Point and from there to the eastward along the bight (Mackerel Cove) to Woodberry Point; three red buoys mark the eastern outer limit of the shoal.

Lobster Rocks, a group of rocks, dry at half tide, are on the northeastern point of the flats on the western side of the channel and are marked by a square granite crib work beacon 200 yards SW. by W. $\frac{1}{2}$ W. from Tuck Point.

MARBLEHEAD HARBOR. *

This harbor, about 1 mile long and $\frac{1}{2}$ mile wide, lies between Marblehead Neck and Marblehead Peninsula, which forms the southern shore of Salem Harbor. Its southern end is separated from the ocean by **Marblehead Beach**, a narrow strip of land connecting Marblehead Neck with the mainland.

The entrance, about $\frac{1}{2}$ mile wide, is between Marblehead Point on the southeast and Fort Sewall on the northwest. Fort Sewall is on the eastern side of Marblehead Peninsula to the eastward of the town, but is not nearly so conspicuous as the cottages and summer houses a little back from it. Marblehead Point is the northern end of Marblehead Neck and is marked by **Marblehead Lighthouse** (see page 10). This lighthouse does not show to the southward of SE. $\frac{1}{2}$ S., owing to the buildings near it, except for small arcs in one or two places where it shows between them. A white lantern-light is shown from a height of 130 feet on a mast near the lighthouse and is visible over the buildings.

The town of **Marblehead** occupies the northwestern shore of the harbor, and is connected with Salem by a railroad.

Marblehead Harbor is of comparatively little commercial importance, but is the rendezvous for yachts while cruising in eastern waters. During July and August over 100 sail may frequently be seen at anchor at one time. The Eastern Yacht Club has a large club-house here. Vessels of 20 feet draught can easily enter the harbor at mean low water; there is 8 to 11 feet alongside the wharves at low water. The deep water extends close to the eastern and western sides of the harbor, but shoals cover the greater part of the bight to the southward of Skinners Head and Boden Point.

The anchorage is anywhere in the middle of the harbor in 18 to 30 feet of water, good holding ground, and is sheltered from all but northeasterly winds; with good ground-tackle vessels have no difficulty in riding out a northeaster.

Pilots.—Strangers generally take a pilot, making a signal when off Marblehead Neck and standing off and on until a branch pilot comes on board. Pilotage is compulsory for certain classes of vessels (see Appendix I).

Towboats are not generally used, but can be obtained from Boston or Gloucester in case of necessity.

Quarantine regulations are established by the local board of health and enforced under the direction of the board. Vessels subject to quarantine are not permitted to come inside of Fort Sewall until boarded by a health officer.

The nearest **Marine Hospital** is at Chelsea, Mass. (see Appendix III).

Supplies.—Provisions can be had in Marblehead; water can be obtained in water boat from Salem.

Wind signals are displayed from a staff on Abbott Hall, Washington Square, and can be readily distinguished by vessels in the harbor.

Ice.—This harbor is rarely obstructed by ice to such an extent as to become a hindrance to navigation; and even during the very cold winter of 1874 and 1875, the harbor was so little obstructed by ice formations that many of the fishermen made it a refuge during the severest part of the winter, when it was impossible to get into either Gloucester, Salem, or Lynn harbors. The formation of ice in Marblehead Harbor is entirely local, and during the severe winter mentioned above occurred only twice, and remained but a short time (see Ice, Salem Harbor).

Tidal data for this harbor is about the same as for Salem Harbor (see page 22).

The **tidal currents** are weak, and do not interfere with navigation.

* See footnote on page 29.

MARBLEHEAD HARBOR—SAILING DIRECTIONS.

SAILING DIRECTIONS, MARBLEHEAD HARBOR.

1. *Approaching and Entering from the Northeastward (passing north of Baker Island).—* Follow the directions in section 1, Sailing Directions, Salem Harbor, and pass about 150 yards to the northward of the black buoy (No. 3) on Baker Island Shoal. When the eastern end of Great Misery Island bears **N. $\frac{1}{2}$ E.** steer **SW. $\frac{1}{2}$ W.** Leave Hardy Rock Shoal buoy (black, No. 5) about 100 yards, and Hardy Rock beacon (spar, black, with two triangles on top) about 200 yards on the starboard hand. When midway between Eagle Island and the spindle on The Brimbles, steer **SW. by W. $\frac{1}{2}$ W.** Pass about midway between Marblehead Lighthouse and Fort Sewall and anchor off the town on the western side of the harbor in 4 to $4\frac{1}{2}$ fathoms water, soft bottom.

Remarks.—On the **SW. $\frac{1}{2}$ W.** course Eagle Island, a low bare rocky islet, and Marblehead Lighthouse will be on the starboard bow and Cat Island on the port bow; the course leads about 250 yards to the southward of Eagle Island.

The **SW. by W. $\frac{1}{2}$ W.** course leads to the northward of Cat Island, about midway between it and Chappel Ledge buoy, and fair into the entrance of the harbor. When past the northern end of Cat Island, Archer Rock buoy will be left well on the port hand; Lasque Ledge and Gordon Rock buoys will also be left on the port hand, and the latter should be given a berth of at least 300 yards to avoid a 17-foot spot about 175 yards to the northeastward of the buoy.

Dangers.—Baker Island Shoal, Hardy Rock Shoal, and Hardy Rocks are described on page 31.

Pope Head Shoal extends a little more than $\frac{1}{4}$ mile in a **W SW.** direction from the southwestern end of Baker Island, has 8 feet over it at its outer end, and is marked by a buoy (black, No. 1).

Cutthroat Ledge has 6 feet over it, lies $\frac{3}{4}$ mile **NE.** from Eagle Island, and is marked at its northern side by a buoy (black, No. 11).

Shoals extend to the northeastward from Eagle Island almost to Cutthroat Ledge and also 160 yards to the eastward from the island.

The Brimbles, Mid-channel Rock, Martin Rock, and Chappel Ledge are described on page 32.

Archer Rock and Lasque Ledge are described on page 33.

Gordon Rock has 7 feet over it, and lies about 80 yards to the northward from Marblehead Lighthouse; to the northward of the rock is a buoy (black, No. 3). A 17-foot spot lies about 350 yards **N. by E. $\frac{1}{4}$ E.** from Marblehead Lighthouse.

Boden Rock, with 8 feet over it, lies about 150 yards from Boden Point, near the eastern shore of the harbor, a little more than $\frac{1}{4}$ mile inside of Marblehead Lighthouse. A buoy (black, No. 5) is placed to the westward of the rock; vessels should not pass to the eastward of it.

1 A. *Approaching and Entering from the Southwestward and Southward.*—Follow the directions in section 1 A, page 31, for entering Salem Harbor by Cat Island Channel. When about midway between Eagle Island and the northern end of Cat Island, haul to the westward and bring Fort Sewall to bear **W SW. $\frac{1}{2}$ W.** and steer for it on that bearing. When Marblehead Lighthouse bears **S. by W.** distant about $\frac{3}{4}$ mile steer **SW. $\frac{1}{2}$ W.** and anchor off the town, as directed in section 1 preceding.

Or, follow the directions in section 1 B, page 32, for entering Salem Harbor by Marblehead Channel. When the beacon on Marblehead Rock bears **SW.** distant about 300 yards steer **NW.** until Marblehead Lighthouse bears **S. by W.**, then steer **SW. $\frac{1}{2}$ W.** and anchor as directed above.

Remarks.—The **W SW. $\frac{1}{2}$ W.** course leads fair between the northern end of Cat Island and Chappel Ledge buoy and $\frac{1}{4}$ mile to the northward of Archer Rock buoy. Marblehead Lighthouse will be on the port bow.

On the **NW.** course from Marblehead Rock beacon Lasque Ledge buoy will be left about 175 yards on the port hand, and when the course is changed to **SW. $\frac{1}{2}$ W.** Gordon Rock buoy will bear a little to the eastward of the line to the lighthouse. In entering the harbor on the **SW. $\frac{1}{2}$ W.** course pass about midway between Fort Sewall and Marblehead Lighthouse. Boden Rock buoy will be on the port bow.

Dangers.—Lasque Ledge is described on page 33. Gordon Rock and Boden Rock are described under section 1.

NAHANT BAY.*

The coast line from Marblehead Neck to Nahant Bay is irregular both in direction and appearance.

From Flying Point, the southwestern extremity of Marblehead Neck, to Blaney Point, the northern point at entrance to Nahant Bay, the direction is **W SW.** and the distance $2\frac{1}{2}$ miles; but the shore line between these two points curves away to the northward and around to the westward, thus forming a wide cove or bay. In this cove, and off its entrance, are a number of rocks, shoals, and ledges (see description under section 1, Sailing Directions, Nahant Bay). Ram Island is a rocky islet lying about $\frac{1}{4}$ mile from the shore and about midway between Flying Point and Blaney Point.

* Shown on chart 149, scale $\frac{1}{20,000}$, price \$0.50.

Marblehead Beach extends from Marblehead Neck about W. $\frac{1}{2}$ N. for $\frac{1}{2}$ mile. It is a narrow sand beach, which separates Marblehead Harbor from the sea, and the town is plainly visible over it. At the western end of Marblehead Beach begin the hills, which come abruptly down to the water's edge and are from 50 to 100 feet high. The high land continues in a W SW. direction for 1 mile to the eastern end of **Phillips Beach**. This beach has a general course of SW. for about $\frac{1}{2}$ mile, and for half its length stretches at the foot of a low cliff (about 20 feet high). For the rest of the distance to Blaney Point the land behind the beach is quite low and flat, but high wooded lands are visible in the distance.

Blaney Point is a high rocky point, the eastern half of which is from 50 to 60 feet high, mostly cleared and cultivated, and presenting a somewhat precipitous face. The western half is about 80 feet high and is thickly wooded.

Along the shore from Marblehead to Nahant numerous large cottages will be seen.

Nahant Bay is one of the smaller subdivisions of Massachusetts Bay and is nearly circular in form. It is contained between Blaney Point on the north and the so-called island of Nahant on the south. Between these two points the bay is $2\frac{1}{2}$ miles wide and about 2 miles long to Lynn Beach or Nahant Beach, which separates it from Lynn Harbor, in Boston Bay. The village of **Swampscott** is situated on the northern shore of the bay, about $\frac{1}{2}$ mile W. from Blaney Point, and is a great summer resort, and the eastern part of the town of Lynn occupies a portion of the northeastern shore of the bay.

Fishing Point, the first headland on the northern shore to the westward of Phillips Point, is a low but prominent rocky point on which is a large hotel. From it numerous houses dot the beach to the northwestward, extending around to Lynn.

Lynn Beach, is a narrow strip of sand separating Nahant Bay from Lynn Harbor. It extends in a S. by W. direction for 1 mile to a high, bluff, rocky head, called **Little Nahant**, the eastern face of which is bold and steep, and is known as **Little Nahant East Point**. On the south, Little Nahant is connected with Nahant by a strip of beach nearly $\frac{1}{2}$ mile long, called **Little Nahant Beach**.

Nahant lies nearly E. and W., and is very irregular in shape. It is a high, rocky peninsula, with a precipitous face to the eastward. It is occupied by a town which is mainly composed of summer cottages. Its eastern extremity is called **East Point**. Nahant is a great summer resort, and steamers ply regularly between it and Boston during the season. The landings are on the south side, in the large cove formed by the curve of the southern shore, which is sometimes called **Nahant Harbor**.

Seven-eighths of a mile NNE. from East Point is a bold rocky islet, 60 feet high, called **Egg Rock**, on which is **Egg Rock Lighthouse** (see page 10).

For tidal data see tides for Boston Lighthouse in table on page 22.

SAILING DIRECTIONS, NAHANT BAY, TO AN ANCHORAGE OFF SWAMPSCOTT.

This is a good anchorage in 3 to 6 fathoms, but it is exposed to winds from the eastward and southward, and is seldom used except by yachts in summer.

1. Approaching and Entering from the Eastward. I. *To pass to the northward of Great Pig Rocks.*—Pass to the southward of Tinker Island, giving the spindle on Roaring Bull a berth of about 400 yards, and steer W SW. $\frac{1}{2}$ W. This course leads fair between the Great Pig Rocks on the port hand and the buoys marking the dangers on the starboard hand. When the spindle on Dread Ledge bears N., distant about $\frac{3}{4}$ mile (Egg Rock Lighthouse bearing S SW.), steer NW. and anchor in 4 to 6 fathoms of water with Fishing Point bearing to the northward of NE.

Vessels of light draught can find good anchorage in 8 to 15 feet of water to the westward of Fishing Point, giving the northern shore a berth of not less than 600 yards.

Remarks.—On the W SW. $\frac{1}{2}$ W. course Halfway Rock will bear directly astern. The bell buoy near the Outer Breakers will be left about $\frac{1}{2}$ mile on the port hand. The course leads midway between Great Pig Rocks on the port hand and Middle Ground buoy (red, No. 4) on the starboard hand. Two red buoys to the southward of Great Pig Rocks will be left well on the port hand.

Dolphin Rock buoy will be left 300 yards on the starboard hand; to the northward of this buoy and in line with it is Sammy Rock buoy and Ram Island. Dread Ledge spindle will be made on the starboard bow; the sailing line leads over $\frac{1}{2}$ mile to the southward of it.

Dangers.—Tinker Island, Roaring Bull, and Outer Breakers are described on page 33.

Great Pig Rocks, a group of bare rocks, surrounded by shoal water, lie $1\frac{1}{2}$ miles SW. $\frac{1}{2}$ W. from Tinker Island.

Southern Shoal Rock, a ledge awash at low water and marked by a buoy (red, No. 6) lies 300 yards SE. by S. from Great Pig Rocks.

Southwest Breakers, a detached shoal with a rock awash at low water, lies about 300 yards SW. from Great Pig Rocks. It is marked by a buoy (red, No. 8).

Middle Ground is a sunken ledge with 5 to 17 feet over it, lying $\frac{1}{2}$ mile NNW. from Great Pig Rocks and about 400 yards SSE. from Ram Island. A buoy (red, No. 4) marks the ledge at its southeastern end. A spot with 18 feet over it lies 500 yards NE. from Middle Ground buoy.

Sammy Rock, with 3 feet over it, lies nearly $\frac{3}{4}$ mile W. $\frac{1}{2}$ N. from Middle Ground buoy and is marked by a buoy (red, No. 6).

Dolphin Rock has 7 feet over it and lies $\frac{1}{2}$ mile NW. by W. $\frac{1}{2}$ W. from Great Pig Rocks. It is marked by a buoy (red, No. 10).

Dread Ledge is a bare rock which lies nearly $\frac{1}{2}$ mile off the southwestern side of Blaney Point. It is marked by an iron spindle with a red cask on top.

II. To pass to the southward of Great Pig Rocks and Outer Breakers.—Steer for Egg Rock Lighthouse on any bearing to the westward of WSW. $\frac{1}{2}$ W. and when within about 1 mile of the lighthouse haul to the northward and steer NW. Anchor in 3 to 6 fathoms to the southwestward of Fishing Point.

Remarks.—The bell buoy placed off the Outer Breakers, $1\frac{1}{2}$ miles to the southward of Tinker Island, can be passed close-to, leaving it on the starboard hand, and the dangers described under paragraph I will be well to the northward.

1 A. Approaching and Entering from the Southward.—Steer for Egg Rock Lighthouse on any bearing to the westward of N. by W. $\frac{1}{2}$ W. and pass $\frac{1}{2}$ mile to the eastward of Egg Rock. When it bears WSW. $\frac{1}{2}$ W. steer NNW. $\frac{1}{2}$ W. and anchor as directed in paragraph I, section 1.

If coming from the westward, give the southeastern shore of Nahant a berth of at least $\frac{1}{2}$ mile. When Egg Rock Lighthouse bears N. steer for it; pass 300 yards to the westward of Egg Rock; continue the N. course and come to anchor off Fishing Point in 4 to 6 fathoms of water.

Remarks.—In coming from the westward, the southern shore of Nahant should be given a wide berth. When past East Point, the most eastern point of Nahant, the N. course should lead 300 yards to the westward of Egg Rock Lighthouse.

Dangers.—**Shag Rocks** are a group of bare rocks lying nearly $\frac{3}{4}$ mile SW. from East Point and about 300 yards from the southern point of Nahant. There is a rock, nearly bare at low water, about 80 yards to the southward of the southernmost Shag Rock.

An 18-foot spot lies 700 yards S. by E. $\frac{3}{4}$ E. from Egg Rock Lighthouse and about $\frac{3}{4}$ mile NNE. from East Point.

An 11-foot spot lies nearly $\frac{1}{2}$ mile WSW. from Egg Rock Lighthouse and 400 yards from the shore of Nahant.

BOSTON BAY,*

situated at the western end of Massachusetts Bay, is included between Nahant Head on the north and Strawberry Point on the south. Between these limits the distance is about $11\frac{1}{2}$ miles. The northwestern part of the bay is called Broad Sound. The principal harbor in the bay is Boston Harbor. It also includes the subordinate ports of Lynn, Neponset, Weymouth, Hingham, Cambridge, and Cohasset.

The shore line of the bay is very irregular, and the western part of the bay, Boston Entrance and Harbor, is studded with islands, rocks, and shoals, which are sufficiently described in connection with that and adjoining harbors.

A table of lighthouses will be found on page 10, which gives the characteristics of the coast and harbor lights from Cape Ann to Point Judith.

Lists of the Life-saving Stations maintained between Cape Ann and Point Judith are given on pages 20-21.

Extracts from the laws of Massachusetts, relating to Pilot and Pilotage, harbors, and Quarantine, are given in Appendix I.

The wind signals of the U. S. Weather Bureau are shown on the coast at the points named in the list on page 20. An explanation of the use and meaning of these signals is given in Appendix II.

BROAD SOUND,

the northwestern portion of Boston Bay, lies NW. and SE. is about 5 miles wide between Deer Island and Nahant, and nearly $3\frac{1}{2}$ miles long. At the head of the sound is Lynn Harbor, the entrance to which is between Bass Point (on Nahant) and Revere Beach. On the east, Broad Sound is separated from Nahant Bay by Lynn Beach, Little Nahant, and Nahant; and its northern shores are occupied by the city of Lynn, one of the great manufacturing cities of New England. On the northwest is Chelsea Beach now known as Revere Beach, at the northern extremity of which is a wooded point known as Point of Pines.

*Shown on chart 337, scale $\frac{1}{40,000}$, price \$0.50; 109, scale $\frac{1}{80,000}$, price \$0.50. See also footnote on page 9.

Deer Island, which separates the entrance to Broad Sound from Boston Harbor, lies **NNW.** and **SSE.**, is nearly 1 mile long, and $\frac{1}{2}$ mile wide at its widest part. To a vessel approaching from the northeastward it will appear as a long bare island with a gently sloping green hill, which appears joined to another to the westward, which has a precipitous descent to seaward. The House of Correction, with its high cupola, appears on the western end of the island. On the spit (dry at low water) at the southern end of the island is **Deer Island Lighthouse** (see page 10).

On the north a channel 80 yards wide separates Deer Island from a low sandy point of the mainland called **Point Shirley**. This passage is known as **Shirley Gut**, and is commonly used by the steamers plying between Boston and Nahant.

Point Shirley is the southwestern extremity of a very long and narrow peninsula, mostly sand beach, which extends in a **S. $\frac{1}{2}$ W.** direction from the mainland to the southward of Revere Beach. The point itself forms a sort of flat head to this peninsula. The city almshouse and other public buildings are situated on this point.

Winthrop Head, a precipitous headland, 100 feet high with many houses on its northern side, is situated $\frac{1}{2}$ mile **NNE.** from Point Shirley and on the western side of the entrance to Broad Sound. From this head a sand beach extends about 1 mile to the northward to **Grover Cliff**, which shows bare, yellow, precipitous faces, about 80 feet high to the eastward, and is the most prominent point between Point Allerton and Nahant Head.

Broad Sound has good water, the depth ranging from 5 to 7 fathoms, but from the western shore shoals make off a long distance. Between Winthrop Head and Grover Cliff shoals extend out $\frac{1}{2}$ to 1 mile, and to the northward on Grover Cliff the 18-foot curve runs northward for $1\frac{1}{2}$ miles and then east to **Bass Point** (the western point of Nahant).

Flip Rock, with 13 feet over it, and surrounded by a depth of 6 to 10 fathoms, is the only outlying danger. It lies **NNE. $\frac{1}{2}$ E.** Easterly, 4 miles from Deer Island Lighthouse and is marked by a buoy (red and black horizontal stripes).

LYNN HARBOR.*

On the northern side of Broad Sound are situated the harbor and city of **Lynn**. The land is low and marshy from the northern bank of Saugus River across the head of the harbor, and it is also much cut up by coves and slues penetrating the marshes in every direction.

The entrance is between Revere Beach on the west and Bass Point, the western point of Nahant, on the east. It is 2 miles wide, but it is so full of rocks and shoals as to leave only very narrow and shallow channels of approach, which are, however, being improved by dredging.

The city of **Lynn** occupies the northern shore of the harbor.* On the south and southwest the city is bounded by extensive salt marshes, which occupy the shore for distances varying from $\frac{1}{2}$ mile to $1\frac{1}{2}$ miles back from the shore-line. On the southwest these marshes extend to **Saugus River**, which empties into Lynn Harbor between Tree Point on the north and Point of Pines on the south. The entrance to this river is $\frac{1}{2}$ mile wide, but the channel is very narrow and the best water is close under Point of Pines. About 4 feet at mean low water may be carried up to the bridge of the Eastern Railroad.

Channel.—A dredged channel with a depth of 10 feet leads up to Lynn. It has a width of 200 feet for a distance of 1,200 yards from its entrance, and a width of 150 feet opposite Sand Point to the city wharves. This channel leads in on the eastern side of the harbor and is entered near **Black Point**, the point just above Bass Point. Occasionally dredging is required to maintain the above given depth and width of the channel.

Wharves.—As much as 10 feet can be carried to some of the wharves in Lynn, at mean low water.

Pilots are to be found off Nahant, in Broad Sound, and are generally taken by vessels bound to Lynn. Strangers should never attempt the channel without a pilot. Sailing vessels generally take a towboat.

The **Marine Hospital**, at Chelsea, is available for mariners entitled to hospital treatment.

Supplies.—Coal, wood, water, and general stores can be obtained at the wharves.

Ice forms in the harbor in severe weather, but it does not endanger vessels.

Tidal data is about the same as for the Navy Yard, Boston (see page 22).

The tidal currents set in the general direction of the channel and are quite strong during part of the ebb.

SAILING DIRECTIONS, LYNN HARBOR.

These directions lead to the entrance to the dredged channel, above which no stranger should go without a pilot.

1. **Approaching from the Eastward**.—Keep the southeastern end of Nahant bearing to the westward of **SW.** by **W.** $\frac{3}{4}$ **W.** and steer so as to pass about $\frac{1}{2}$ mile to the southward of Nahant, and when Egg Rock is in range with the southeastern end of Nahant, steer **WNW.** $\frac{1}{2}$ **W.** When Bass Point bears **N.** distant about 600 yards, steer **NW.** and anchor in $3\frac{1}{2}$ fathoms, or stand off and on with signal set until boarded by a pilot.

* See footnote on page 38.

Remarks.—The **W NW. $\frac{1}{2}$ W.** course leads $\frac{1}{2}$ mile south of the red buoy on Joe Beach Ledge, 400 yards south of the spindle on Bass Rock, and $\frac{3}{4}$ mile north of Flip Rock. The steamboat landing at Nahant will be seen to the northward. The entrance to Nahant Harbor is between Joe Beach Ledge buoy and Bass Rock spindle (see Dangers, following); vessels may stand in between the two and anchor to the southwestward of the landing in 4 to 4 $\frac{1}{2}$ fathoms of water.

Bass Point the southwestern point of Nahant, should be left about $\frac{1}{2}$ mile on the starboard hand.

When standing **NW.** some of the buoys marking the channel to Lynn will be on the starboard bow; the water shoals gradually on the course and on approaching Chelsea Beach.

Dangers.—Shag Rocks are described on page 38 and should be given a berth of about 450 yards.

Flip Rock is a small detached ledge, with 13 feet over it, lying nearly 1 $\frac{1}{2}$ miles **SW.** by **W. $\frac{1}{2}$ W.** from the southeastern point of Nahant; it is marked by a buoy (red and black horizontal stripes).

Bass Rock, is bare at half tide with shoal water around it and lies nearly in the middle of the entrance to Nahant Harbor, about $\frac{1}{2}$ mile **SE.** by **E. $\frac{1}{2}$ E.** from Bass Point. It is marked by a spindle (iron, with cage on top, red). Shoal water extends nearly 300 yards to the northwestward from the spindle.

Joe Beach Ledge is a small ledge with 5 feet over it, lying nearly $\frac{1}{2}$ mile **E. $\frac{1}{2}$ N.** from the spindle on Bass Rock and about 250 yards from shore. It is marked by a buoy (red, No. 2).

A spot with 17 feet over it lies about 175 yards **SSW.** from Bass Point.

1 A. Approaching from the Southward.—From a position to the eastward of Minots Ledge steer **NNW. $\frac{1}{2}$ W.** until Long Island Head Lighthouse bears about **W SW.**; then steer more to the westward so as to pass $\frac{1}{4}$ to $\frac{3}{4}$ mile to the westward of Bass Point, the southwestern point of Nahant; anchor when Bass Point bears **E.** or stand off or on for a pilot, keeping Bass Point bearing to the northward of **E.**

Remarks.—The **NNW. $\frac{1}{2}$ W.** course should lead to the eastward and clear of The Graves. The whistling buoy off **NE. Graves** should be left on the port hand. A sharp lookout should be kept for Flip Rock buoy, which can be left 250 yards on either hand. See the dangers under section 1 preceding.

1 B. Approaching from Boston Harbor.—Stand out through the Broad Sound South Channel and when about $\frac{3}{4}$ mile past Devil Back buoy (black, No. 1) steer **N.** by **W. $\frac{3}{4}$ W.** and anchor as directed in section 1. See the remarks and dangers in the two preceding sections.

BOSTON ENTRANCE AND HARBOR.*

The entrance to Boston Harbor, between Point Shirley on the north and Point Allerton on the south, is about 4 $\frac{1}{2}$ miles wide, but is full of islands and shoals between which several channels (see channels) lead into the harbor.

Point Shirley and Deer Island are described on page 39.

Point Allerton, a very conspicuous headland, is a bare hill 115 feet high, presenting a steep, water-worn, cliff-like face to the eastward. The summit is grassy and many houses will be seen on its slopes and the base of the sea face is protected by a sea wall of granite. It presents an appearance very similar to Great Brewster (except that the northern end of the point is the lower).

About 1 mile to the southward of Point Allerton is quite a prominent hill called **Strawberry Hill**, on the top of which is a dark, round water tower, which shows prominently from all directions and is the most prominent landmark in approaching the main channel entrance.

Nantasket Hills lie about 1 mile to the westward of Point Allerton, and are 100 to 125 feet high. On the highest, called simply Nantasket Hill or Telegraph Hill, there is an ancient earthwork; the lower hills present cliff-like faces on their northern side. Wind signals of the Weather Bureau are shown from Nantasket Hill.

Outer Brewster, the easternmost of the group of islands at the entrance to Boston Harbor, and lying about 2 miles **N.** by **E.** from Point Allerton, is a prominent object met with in approaching from the eastward. It is a bare rocky island 60 feet high, presents a very rugged appearance, and its shores are bold-to.

Middle Brewster, a mass of rock about 50 feet high, lies about 300 yards to the westward of Outer Brewster, and is somewhat less rugged in appearance. A narrow and dangerous passage, called **Flying Place**, separates the two.

Lighthouse Island, a low rocky islet of irregular shape, lying about $\frac{1}{2}$ mile **SSW.** from Middle Brewster, is on the north side of the Main Ship Channel and on it is **Boston Lighthouse** (see table, page 10) with its accompanying dwelling and fog-signal houses.

Great Brewster, about 800 yards **NNW.** from Lighthouse Island (with which it is connected by a long bar or sand spit, bare at low water) is a very peculiar looking island about 100 feet high, and presents a precipitous face to seaward. Its very remarkable shape renders it a landmark not to be mistaken. The sea face is a precipitous water-

worn cliff, the base of which is protected by a sea wall. The summit is smooth and grassy but bare of trees. From the southwestern end of Great Brewster a long dry sand spit or bar extends to the westward for $\frac{1}{2}$ mile to The Narrows. This is called *Spit Bar* or *Brewster Bar*, and on its end is *Narrows Lighthouse* (see page 10).

Calf Island, lying about $\frac{1}{2}$ mile to the northward of Great Brewster, is a small grassy island about 30 feet high.

Little Calf Island, about 100 yards in diameter, lies about 300 yards to the northward of Calf Island.

Green Island, a small island of moderate height, with an undulating surface, and faced on its eastern side by whitish looking rocks, lies about $\frac{1}{2}$ mile to the northeastward of Little Calf Island.

Georges Island, on the southwest side of The Narrows, about $\frac{1}{2}$ mile to the southwestward of Narrows Lighthouse, is entirely occupied by *Fort Warren*. The fort is a casemated granite work surmounted by traverses of earth and faced by earth work water batteries.

Lovell Island, on the north side of the Main Ship Channel, lies about $\frac{1}{2}$ mile to the northward of Georges Island and is about 30 or 40 feet high. The northern and southeastern ends of the island are protected by sea walls which are joined by a stone apron.

Gallup Island, narrow and bare of trees, with a precipitous face on its northern side, is on the western side of the channel, directly opposite Lovell Island, and on it is the *Quarantine Hospital*, under the control of the Board of Health. The cliff and sea face of Gallup Island are protected from the action of the water by a granite sea wall.

Long Island, lying about $\frac{1}{2}$ mile to the westward of Gallup Island and on the southern side of the channel, is $1\frac{1}{2}$ miles long in a NE. and SW. direction and about 80 feet high at its highest part. The northern end (and highest part) of this island is called *Long Island Head*. This head shows a steep, water-worn cliff to the northward, and on its summit is *Long Island Head Lighthouse* (see page 10) and keeper's dwelling.

Spectacle Islands or *The Spectacles*, lying about 1 mile to the westward of Long Island and on the south side of the channel, are two small islands close together and about 65 feet high. Except on the southern side, these islands have cliff-like faces. There is a group of houses near the southern end of each of the islands.

Thompson Island, lying about $\frac{1}{2}$ mile to the westward of The Spectacles, and off the entrance to Neponset River, is about 75 feet high at its highest point (near the middle of the island); on this point is a group of buildings surrounded by ornamental grounds. It presents a precipitous face to the northward, but is low to the southward.

Castle Island, easily recognized by *Fort Independence* (which is built of granite, surmounted by sod traverses, and occupies the whole island), lies on the south side of the channel about $2\frac{1}{2}$ miles W NW. from Long Island Head Lighthouse. It is connected with the mainland by a long bridge.

Governors Island, on the northern side of the channel, a little over $\frac{1}{2}$ mile from Castle Island, is of irregular shape, about $\frac{1}{2}$ mile long, and about 70 feet high at its highest point. The hill at its western end is covered with earthworks, known as *Fort Winthrop*. The southeastern part of the island is much lower and has a few small water batteries near the shore. A channel, in which there is not less than 3 fathoms at low water, leads between it and *Apple Island*, which lies about $\frac{1}{2}$ mile E NE. from it.

From many of the islands above described shoals make out, and are described under the head of "dangers," following the sailing directions.

Boston Harbor proper, or the Inner Harbor, begins to the westward of Castle and Governors Islands. It is irregular in shape and has extensive flats, but a deep channel. It is about 2 miles long and the deep water part varies in width from $\frac{1}{2}$ to $\frac{3}{4}$ mile. Extensive flats originally filled the large bight between Dorchester Point (City Point) and the eastern extremity of Boston proper, but they have been partly, and are still being, reclaimed and built upon, extending the wharf line to the edge of the channel.

The City of Boston was formerly that part of the city built upon the peninsula between South Bay and Charles River, on the western side of the harbor, but it now also includes within its limits East Boston, Charlestown, South Boston, Roxbury, Dorchester, and Neponset. East Boston is on the northeastern side of the harbor on *Noddie Island* and is separated from the city of Chelsea by a shallow stream called Chelsea River. Chelsea is separated from Charlestown, on the western side of the harbor, by the Mystic River, and Charlestown from Boston proper by the Charles River.

The U. S. Navy Yard occupies nearly all the deep water shore line of Charlestown and is very conspicuous on account of its ship houses, foundries, and other large buildings. South Boston is on the peninsula southeast of the city proper, from which it is separated by South Bay and the narrow channel leading into it.

Chelsea River is a narrow and shallow stream flowing into the northern part of the harbor and separating East Boston from the city of Chelsea.

Mystic River takes its rise at Medford, $3\frac{1}{4}$ miles above its mouth, and flows through a very crooked channel, but with a general direction about SE. into the northern part of Boston Harbor. Near its mouth it is crossed by *Chelsea Bridge*, connecting Charlestown with Chelsea. A channel not less than 23 feet deep at mean low water,

with a least width of 375 feet, leads between the Charlestown district and East Boston as far as the north end of Chelsea Bridge. This channel is well on the eastern side and leads close to the wharves on the west side of East Boston.

Charles River empties into the western part of the harbor between Boston proper and Charlestown, and is the approach by water to the city of **Cambridge** and town of **Watertown**. No less than seven bridges cross the river at points less than $1\frac{1}{2}$ miles from its mouth; four of these are railroad bridges, the draws of which are closed except for a short specified time each day. There is a channel with 18 to 23 feet of water in the Charles River for a distance of about $1\frac{1}{2}$ miles from its mouth, nearly up to Cragie's (the seventh) Bridge, but the numerous bridges greatly retard its free navigation.* There are two hauling buoys placed in mid-channel, about 500 yards below the Charles River (first) Bridge. To these all vessels wishing to pass the draw must moor, running a stern line to the guard of the bridge. Tiers are thus formed on the north side of the channel, and vessels must wait their turn in passing the draw.* The superintendent of the draws has entire charge of the passage of vessels and notifies the masters when their turn comes. Wherever the distance is sufficiently great between the bridges to render them necessary, hauling buoys are moored. Above Cragie's Bridge towboats are stationed which do towing at the regular rates, but towboats from the harbor will take vessels through, if specially engaged for the purpose. The least width in the clear of any draw below Cambridge is 35 feet 4 inches, and above Cambridge the least width of any draw is 29 feet 5 inches.

At mean low water the depth off the city of Cambridge is 11 feet. At high water 9 feet can be carried up to Watertown, which is as far as vessels can go. Towboats are usually employed by vessels going up the river.

Prominent objects.—In approaching and entering Boston Harbor the most conspicuous object is the **State House**, built on the highest part of the city, its large gilded dome being visible for many miles. **Bunker Hill Monument** in Charlestown, the tall chimney of the Almshouse on Deer Island, Great Brewster Island, Point Allerton, Nantasket Hill and Strawberry Hill (see descriptions of the last four) should also be easily recognized as the entrance is approached.

At night the many lights (see table, page 10) of the bay and harbor should make the approach to the entrance easy, but strangers should not attempt to enter at night, as the channels are narrow in many places and the many lights are apt to be confusing. (To make an anchorage in Nantasket Roads at night, see section 1C, sailing directions.)

Channels.—There are a number of channels leading into Boston Harbor. The principal ones leading in from deep water are the Main Ship Channel, Broad Sound South Channel, and Broad Sound North Channel.

Main Ship Channel.—The entrance to this channel is between Lighthouse Island (on which is Boston Lighthouse) on the north and Point Allerton on the south, and is $1\frac{1}{2}$ miles wide. It contracts toward **The Narrows**, where the width is $\frac{1}{2}$ mile. The course is first about W. for $1\frac{1}{2}$ miles, then leads through **The Narrows**, between **Narrows Lighthouse** (on Spit Bar) and **Georges Island** (on which Fort Warren is built); then between **Lovell Island** and **Gallup Island** until up with **Nix Mate** beacon; then towards **Deer Island**, joining the **Broad Sound Channels**; then through **President Roads**, passing to the southward of **Deer Island** and to the northward of **Long Island** and the **Spectacle Islands**, and then about NW. $\frac{1}{2}$ N. up to the city, passing between **Governors Island** on the north and **Castle Island** on the south. This channel, $7\frac{1}{2}$ miles in length from the entrance to the anchorage off the Boston wharves, has a width of not less than 200 yards, with not less than 23 feet water. (To enter by this channel proceed as directed in sections 1, 2, and 3 of the sailing directions.)

Broad Sound South Channel.—The entrance to this channel is to the northward of **The Graves**, its general direction being about W SW. for **Long Island Head Lighthouse**. There are shoals and dangers on both sides of this channel, but with half flood, vessels of the largest draught should have no trouble in entering by it in clear weather (see section 1A, sailing directions).

Broad Sound North Channel.—This channel leads from Broad Sound across **Great Faun** and **Little Faun** bars into **President Roads**. Its entrance is just to the westward of the entrance to **Broad Sound South Channel**, and its direction is about W SW. Although 13 feet at mean low water can be carried across the two bars, the channel is narrow and should not be attempted by strangers of over 10 feet draught. (To enter by this channel follow the directions in section 1B of the sailing directions.)

Governors Island Channel.—This channel, which is only fit for steamers, begins at the eastern end of **Governors Island Flats** and runs in a W NW. direction, between **Governors Island** and **Apple Island**, for a little over $1\frac{1}{2}$ miles. Then, turning abruptly to the southward, it runs between **Bird Island** and **Governors Island** into the **Main Ship Channel**. It is crooked at its western end and quite narrow; but a steamer can carry 19 $\frac{1}{2}$ feet at mean low water throughout its entire length. It is well buoyed (see section 3 A, sailing directions).

In addition to the channels already mentioned there are several others, sometimes used by those who are well acquainted with their dangers. These are: (1) the **Hypocrite Channel**, 19 feet of water, which connects **Boston Bay** with the **South Channel**; (2) the **Black Rock Channel**, 18 feet of water, connects the **Main Ship Channel** with the

* When the tiers are full, vessels must anchor in two parallel lines in mid-channel off East Boston, and above the mouth of the Charles River.

Hypocrite Channel; (3) the **Back or Western Way** runs to the southward and westward of the islands that form the southern limits of the Main Ship Channel, leaving that channel at the entrance to Nantasket Roads; the Back or Western Way carries deep water as far as Long Island, but beyond this point only 9 feet can be carried with safety; (4) **Shirley Gut**, a narrow slue between Deer Island and Point Shirley, carrying about 14 feet of water, connects Broad Sound directly with President Roads; (5) the dredged channel between Long Island and Nix Mate has a depth of 15 feet and width of 200 feet (see section 2 C, sailing directions).

Anchorage.—Nantasket Roads is a good anchorage on the south side of the entrance to the Main Ship Channel, south of Narrows Lighthouse and Georges Island (Fort Warren). The depth here varies from 5 to 11 fathoms, but on the western side of Georges Island the depth ranges from $3\frac{1}{2}$ to 5 fathoms and better shelter is found in easterly winds. This anchorage is frequently used by vessels bound through the Main Ship Channel and headed off by the winds, and vessels seeking shelter in easterly gales.

President Roads, a wide and good anchorage, lies between Governors Island Flats and Deer Island Flats on the north, Deer Island on the east, Long Island and The Spectacles on the south, and Castle and Governors islands on the west. It is within these limits, $1\frac{1}{2}$ miles long and nearly $\frac{1}{2}$ mile wide, and is entered from the Main Ship and Broad Sound channels at its eastern end. The anchorage in the inner harbor is limited, but good holding ground in $3\frac{1}{2}$ to 4 fathoms of water will be found on the south side of the channel within the limits prescribed by the rules and regulations of the harbor master.

The Buoyage of Boston Harbor and its tributaries accords with the system now adopted in United States waters (see page V). The channels leading to Boston are well buoyed; but strangers should not attempt them at night, as they have sudden changes in direction, are narrow in places, and are liable to be confusing to strangers, even in the daytime.

The Table of lighthouses, on page 10, gives the characteristics of the lights in Boston Harbor.

Bearings and distances from certain lighthouses are given on pages 18–20.

Pilots.—There are a number of pilots for the port of Boston who cruise by turns in pilot boats which are designated by the numbers painted in black figures 4 feet in length on the mainsail and jib. Three of the pilot boats are required to cruise in Boston Bay outside of the inner station boat.

Pilots frequently board vessels bound to Boston 200 miles from Boston Lighthouse. With the exception of two, the Boston pilot boats cruise anywhere in Massachusetts Bay. One boat is required to cruise outside of Boston Lighthouse and inside of a line drawn from Minots Ledge Lighthouse to Nahant Head, and another is required to remain in sight of Cape Cod, between the limits of Race Point Lighthouse bearing S. and Cape Cod Lighthouse bearing W NW. There is a pilot signal station and telegraph office on Cape Cod.

Pilotage.—The rates of pilotage for Boston, and extracts from the Massachusetts laws relating to pilots and pilotage are given in Appendix I.

Towboats are constantly cruising in Boston Bay and Harbor, and may be obtained by hailing or by signal. They may also be obtained by applying at the various towboat offices on Commercial, Central or Lewis wharves. The greater number of these towboats have an established schedule of charges prescribed by the Towboat Association. A few towboats, not belonging to the association, tow for prices agreed upon at the time. Towboats do not assume accountability for damage while towing through bridges. Pilotage charges, if incurred, are paid by the vessel being towed.

Fire and wrecking tugs are to be obtained of the Commercial Wharf Towboat and the Boston Towboat companies. Tugs belonging to the former company are to be found at the Battery wharf at night. The towboats of the latter company will take tows to or from any point on the Atlantic coast between Nova Scotia and the Gulf of Mexico. Steam lighters can be obtained.

Harbor regulations are given in Appendix I.

Quarantine regulations for the port of Boston are issued from time to time by the board of health for the guidance of the port physician, harbor master, pilots, and all vessels. The quarantine ground is that part of Boston Harbor bounded by Deer Island on the N., Long Island and Spectacles Island on the S., Nix Mate on the E., and red buoy No. 6 on the W. Here vessels are boarded by the visiting health officer, and no vessel subject to visitation must pass to the westward of buoy No. 6, without the permission of this officer. The office of the port physician, who has charge of quarantine inspection, is at the quarantine station on Deer Island.

There is a **U. S. Marine Hospital**, under the control of the U. S. Marine Hospital Service, at Chelsea. The Marine Hospital service has an office and dispensary in the custom-house, Boston. Here outpatients are treated by a Marine Hospital surgeon, who is also the proper person to whom to apply for admission to the hospital. Seamen serving on board American vessels are admitted upon the filing of the proper certificate by the master of the vessel to which they belong. Foreign seamen obtain admission through their consuls. Extracts from the revised regulations for the government of the Marine Hospital Service are given in Appendix III. The U. S. Naval Hospital is also at Chelsea.

BOSTON HARBOR—GENERAL INFORMATION—CURRENTS.

Docking facilities are ample for all classes of vessels entering Boston Harbor. The dimensions of the largest dock, not owned by the Government, are: length 465 feet, width 66 feet, depth over sill 18 feet 8 inches; of the next in size, length 250 feet, width 45 feet, depth over sill 16 feet. The granite dry dock at the Navy Yard, when not required for Government use, is available for large vessels, the charges conforming to those in force at the port. The dimensions are: greatest keel block length 355 feet, width 60 feet, depth over sill 25 feet.

Wind signals of the U. S. Weather Bureau are shown from the post-office building. An explanation of the use and meaning of these signals is given in Appendix II.

A branch office of the U. S. Hydrographic Office is established at the custom-house, Boston. Bulletins are posted here giving information of value to seamen, who are also enabled to avail themselves of publications pertaining to navigation, to take barometer comparisons, and to correct their charts from standards. No charge is made for this service.

Ice.—Except during very severe winters the Main Ship Channel into Boston Harbor is kept open by the constant employment of towboats, which break the ice in towing vessels up and down. In the minor passages, however, navigation is generally suspended during severe weather. Communication with Boston being, as a rule, carried on through the Main Ship Channel, the ice boats do not enter the other channels to break the ice. The Charles, Mystic, and Chelsea rivers are, as a rule, closed to navigation during a part of the winter. During very severe weather the ice sometimes forms as far out as the edges of the Main Ship Channel; and in exceptional cases the entire harbor is closed.

As a rule, from the middle of January to the middle of February sailing vessels should not attempt to pass in or out of the harbor without the assistance of an ice boat, as without such aid navigation is rendered extremely hazardous on account of the large quantities of drift ice in the channel. Formations of drift ice do not occur in the harbor itself; but where there are large quantities of drifting ice in and around the entrances, the channel is liable to be heavily encumbered during easterly winds. The current of ebb has considerable influence in carrying the broken ice out of the harbor, and when assisted by fresh westerly winds it seldom fails to clear the channels. The flood, on the contrary, has a tendency not only to hold the ice in the harbor, but also to bring drift ice in from the bay. In strong westerly winds, however, its influence is very much modified, and in some cases overcome. Vessels entering the harbor during the winter should not depend too much upon the buoys, as these are apt to be forced from their proper positions and even carried away by the drift ice. As accidents of this sort are liable to occur every winter, no vessel should attempt to enter the harbor during these months without a pilot.

Tidal data for Boston Harbor is given on page 22.

TIDAL CURRENTS IN BOSTON HARBOR.

STATIONS.		First Quarter.		Maximum.		Third Quarter.	
		Set.	Drift.	Set.	Drift.	Set.	Drift.
1	Three-eighths of a mile S. of Bird Island.	NW. $\frac{1}{2}$ N.	0.8	NW. $\frac{1}{2}$ N.	1.3	NW. $\frac{1}{2}$ N.	0.9
		ENE. $\frac{1}{2}$ E.	0.8	ENE. $\frac{1}{2}$ E.	1.2	E. $\frac{1}{2}$ N.	0.7
2	Three-eighths of a mile N. of Spectacle Islands.	W. $\frac{1}{2}$ N.	0.6	W. by N.	0.9	W. $\frac{1}{2}$ N.	0.7
		ENE. $\frac{1}{2}$ E.	0.7	ENE. $\frac{1}{2}$ E.	0.9	E. $\frac{1}{2}$ N.	0.7
		SW. $\frac{1}{2}$ W.	0.5	SSW.	0.7	S. $\frac{1}{2}$ W.	0.3
3	W. of Long Island Lighthouse.	NE. $\frac{1}{2}$ N.	0.4	E. by N.	0.9	NE. by E. $\frac{1}{2}$ E.	0.4
4	Between Long Island Lighthouse and Deer Island Point Lighthouse.	WNW. $\frac{1}{2}$ W.	1.4	WSW. $\frac{1}{2}$ W.	2.5	NW. by W. $\frac{1}{2}$ W.	1.2
		E. $\frac{1}{2}$ S.	1.4	E. by S.	3.3	E. $\frac{1}{2}$ S.	2.1
5	Between Lovell and Gallup Islands.	SSE.	0.3	NW. by N.	0.6	NW. by N.	0.4
		NNW.	0.2	N. $\frac{1}{2}$ W.	0.9	N. $\frac{1}{2}$ W.	0.5
6	Between False Spit Beacon and Centurion Buoy.	W. by S.	1.0	SW. by W. $\frac{1}{2}$ W.	1.5	W. by N.	0.6
		ENE. $\frac{1}{2}$ E.	0.6	ENE.	1.2	E. $\frac{1}{2}$ N.	0.7
		WSW. $\frac{1}{2}$ W.	1.1	WSW. $\frac{1}{2}$ W.	2.1	WSW. $\frac{1}{2}$ W.	1.4
7	N. of Peddock Island.	ENE. $\frac{1}{2}$ E.	0.8	NE. by E. $\frac{1}{2}$ E.	1.3	ENE. $\frac{1}{2}$ E.	0.6
		W. $\frac{1}{2}$ S.	1.3	W. $\frac{1}{2}$ S.	1.6	W. by S.	1.2
8	Between Boston Lighthouse and Point Allerton.	E. $\frac{1}{2}$ S.	1.0	E. $\frac{1}{2}$ S.	1.5	E. by S.	1.2
		SW. by W.	0.6	SW.	1.0	SW. $\frac{1}{2}$ W.	0.6
9	W. of Calf Island.	NNE. $\frac{1}{2}$ E.	0.5	NE. $\frac{1}{2}$ E.	0.6	NE. $\frac{1}{2}$ E.	0.5
		SW. $\frac{1}{2}$ W.	0.6	SW. $\frac{1}{2}$ W.	1.1	SW. $\frac{1}{2}$ W.	0.7
10	Between the Outer Brewster and The Graves.	NE. by E. $\frac{1}{2}$ E.	0.8	NE. by E. $\frac{1}{2}$ E.	1.1	NE. by E. $\frac{1}{2}$ E.	0.6
		SSW. $\frac{1}{2}$ W.	0.2	WNW. $\frac{1}{2}$ W.	0.3	WNW. $\frac{1}{2}$ W.	0.2
11	Broad Sound Channels.	ESE. $\frac{1}{2}$ E.	0.3	ESE. $\frac{1}{2}$ E.	0.5	ESE. $\frac{1}{2}$ E.	0.4
		WSW. $\frac{1}{2}$ W.	0.3	W. $\frac{1}{2}$ S.	0.4	W. $\frac{1}{2}$ N.	0.3
12	SE. of Nahant Point.	NE. by E. $\frac{1}{2}$ E.	0.2	E. $\frac{1}{2}$ N.	0.4	NE. by E.	0.2

In the above table, at each station, the set and drift of the flood tide is placed first, followed by that of the ebb. The set is magnetic; the drift is in nautical miles per hour.

At Station 4 ebb begins about 20 minutes after high water, and flood about 20 minutes after low water, at the Navy Yard.

At Station 8 ebb begins about 10 minutes after high water, and flood about 10 minutes after low water, at the Navy Yard.

Two miles E. from Boston Lighthouse the tidal current is weak. Between the lighthouse and Point Allerton the flood sets up channel, but the ebb coming from Nantasket Gut sets somewhat across the channel towards the Spit. Care must be taken accordingly.

Vessels bound up through The Narrows must be careful, after passing False Spit beacon, not to be set on to Georges Island rocks on the flood tide, as the current of the flood sets through the Black Rock Channel strongly on to Georges Island. The ebb sets strongly through the same channel, and vessels coming down from The Narrows, between Lovell and Gallup islands, are in danger of being carried by it on to Whiting Ledge or into the Black Rock Channel.

The flood, setting between Gallup and Georges islands may, in light winds, carry a vessel through when going up; but here the channelway and anchorage are good.

In the northern part of The Narrows the flood during part of its period sets to the southward, but is not strong. The ebb, which is stronger, sets to the northward, and it requires a quick working vessel to beat down The Narrows against an ebb current.

Near New Mate the ebb will, in light winds, carry vessels out through the Broad Sound Channel.

Along the northwestern side of Long Island the flood sets to the southwestward for about two hours; the current then turns and sets to the northward and eastward during the remaining period of flood, and so continues throughout the period of ebb. While setting thus during this period of flood it meets the current coming in through the Broad Sound Channel, and this causes a heavy rip at times near Long Island Head.

The variation of the compass for various points between Cape Ann and Point Judith is given on page 22.

SAILING DIRECTIONS, BOSTON HARBOR.

Bearings and distances from a number of lighthouses are given on page 18, which will be useful in laying a course for Boston Entrance.

In following the sailing directions sufficient allowance should be made for tidal currents, the set and drift of which are given on page 44, and it is always advisable and generally easy to pick up a range ahead when entering.

1. Approaching Main Ship Channel Entrance. I. Coming from the northward or north-eastward.*

As the entrance is approached keep to the eastward of a line (which runs N. by W. $\frac{1}{4}$ W. and S. by E. $\frac{1}{4}$ E.) joining Egg Rock and Minots Ledge lighthouses, until Boston Lighthouse is brought to bear W., when steer so as to pass nearly $\frac{3}{4}$ mile south of it; then follow directions under section 2, following.

Or, keep to the eastward of the line joining Egg Rock and Minots Ledge lighthouses until Point Allerton (see description, page 40) bears SW. $\frac{1}{2}$ W., when steer for it until Boston Lighthouse bears W NW. when steer W. $\frac{1}{4}$ N. so as to pass about $\frac{3}{4}$ mile south of the lighthouse, then follow directions under section 2 following, or section 1 C if bound to an anchorage in Nantasket Roads.

Remarks.—In approaching the entrance Point Allerton, Great Brewster (see description, page 40), and Boston Lighthouse are prominent objects and should be easily recognized. Coming from the northeastward, a lookout should be kept for the three red buoys marking the outlying ledges to the northeastward of Boston Lighthouse. The sailing line (standing in on a bearing for Point Allerton) leads to the eastward of these and to the northward of Thieves Ledge; the latter is dangerous in heavy weather when the sea breaks on it. When Boston Lighthouse bears W. Narrows Lighthouse should be just open to the southward of it.

Dangers.—The Graves are a dangerous group of bare rocks, about 600 yards long, in a general N NE. and S SW. direction. They lie about $2\frac{1}{2}$ miles NE. by N. from Boston Lighthouse and $4\frac{1}{2}$ miles S. $\frac{1}{4}$ E. from Egg Rock Lighthouse.

About 450 yards NE. $\frac{1}{4}$ N. from the bare rock is a small rock, bare at low water, called the Northeast Grave; and a little over $\frac{1}{4}$ mile to the northeastward of the latter is the mammoth whistling buoy, which is the principal thick weather aid for vessels approaching from the northward.

Three and one-half fathom Ledge is a small detached spot with the depth over it indicated by its name. It lies about $2\frac{1}{2}$ miles NE. by E. $\frac{1}{4}$ E. from Boston Lighthouse and about $1\frac{1}{2}$ miles S. by E. $\frac{1}{4}$ E. from the whistling buoy off The Graves, and is marked by a buoy (red, No. 2) placed to the southeastward of its shoalest part.

Martin Ledge is a small detached spot with 16 feet over it, lying $1\frac{1}{2}$ miles NE. by E. $\frac{1}{4}$ E. from Boston Lighthouse and about $\frac{1}{4}$ mile E from the eastern end of Outer Brewster Island. It is marked by a buoy (red, No. 4) placed to the eastward of the ledge.

Boston Ledge has 17 feet over it and lies a little over $1\frac{1}{2}$ miles E. $\frac{1}{4}$ N. from Boston Lighthouse; it is marked by a buoy (red, No. 6).

* Coming from the eastward or southward, follow directions in paragraph II.

A gas lighted buoy is moored just inside the bell
buoy off Harding Ledge.

BOSTON HARBOR—SAILING DIRECTIONS.

Thieves Ledge has a least depth of 5 fathoms over it and lies about $2\frac{1}{2}$ miles ESE. $\frac{1}{2}$ E. from Boston Lighthouse. It is dangerous in heavy easterly gales, when the sea breaks on it. At low water it should be avoided by vessels of over 24 feet draught even in a smooth sea. There is another spot with 6½ fathoms over it lying $1\frac{1}{4}$ miles SE. by E. $\frac{1}{2}$ E. from Thieves Ledge, upon which the sea sometimes breaks in heavy easterly gales.

Harding Ledge and the dangers between it and Minots Ledge are described under paragraph II following.

Shag Rocks or Egg Rocks are a cluster of bare, dark rocks lying to the eastward of Boston Lighthouse.

A 15-foot spot lies about 400 yards S. by E. from the lighthouse.

Point Allerton Bar makes off a little more than $\frac{1}{2}$ mile to the eastward and northward from Point Allerton. At its northern side is a buoy (black, No. 3) near an 8-foot spot, and on the end of the dry part of the bar is a beacon (pyramidal stone structure, with shaft and black cone on top).

A spot with $3\frac{1}{2}$ fathoms over it lies nearly $\frac{1}{2}$ mile S. by W. from Boston Lighthouse.

II. Coming from the eastward or southward.—When Boston Lighthouse is made, it may be steered for on any bearing between W. and NW. by W. $\frac{1}{2}$ W. until about 2 miles from it when the course should be changed so as to pass about $\frac{3}{4}$ mile to the southward of it, and the directions in section 2 followed.

In coming from the southeastward or southward, when Minots Ledge Lighthouse is made, steer for it; and as it is approached, change the course so as to pass about $1\frac{1}{2}$ miles to the northeastward of it, taking care to avoid a small rock with $3\frac{1}{2}$ fathoms over it which lies $2\frac{3}{4}$ miles E. $\frac{1}{2}$ S. from Minots Ledge Lighthouse. When this lighthouse bears SW. distant $1\frac{1}{2}$ miles, steer NW. by W.; Boston Lighthouse, if not then visible, should be made right ahead, and should be kept on that bearing until within about $1\frac{1}{2}$ miles of it, when the course should be changed to the westward so as to pass nearly $\frac{3}{4}$ mile to the southward of it. Then follow the directions in section 2 following.

If bound to an anchorage in Nantasket Roads, follow the directions in section 1C.

Remarks.—For prominent objects in approaching see page 40. On a clear day Boston Lighthouse should be made when abreast of Minots Ledge Lighthouse, if not before.

The NW. by W. course (on a bearing for Boston Lighthouse) leads between Harding Ledge and Thieves Ledge and to clear both of these ledges the bell buoy off Harding Ledge should be left about $\frac{1}{2}$ mile on the port hand. Point Allerton beacon and Narrows Lighthouse will show on the port bow, and when approaching the entrance and hauling to the westward the latter should be ahead, bearing about WNW. $\frac{1}{2}$ W.

Dangers.—A small rocky patch, with $3\frac{1}{2}$ fathoms over and 9 to 13 fathoms around it, lies $2\frac{1}{2}$ miles E. $\frac{1}{2}$ S. from Minots Ledge Lighthouse.

Tautog Ledge is a small detached shoal with $5\frac{1}{2}$ fathoms over it lying a little over $1\frac{1}{4}$ miles NE. by E. $\frac{1}{2}$ E. from Minots Ledge Lighthouse. The sea breaks on this ledge during heavy gales and also over a small $4\frac{1}{2}$ fathoms spot lying $\frac{1}{2}$ mile NE. by E. from the lighthouse.

Harding Ledge shows bare at half tide and is marked by a spindle; it is a little to the southward of a line from Minots Ledge Lighthouse to Boston Lighthouse and bears SE. by E. $\frac{1}{2}$ E., distant $1\frac{1}{2}$ miles from Point Allerton beacon. A black bell buoy is placed about $\frac{1}{2}$ mile NE. from the spindle on the ledge.

To the westward of Harding Ledge are a number of spots with 15 to 18 feet over them, and a small rock, showing bare at low water, lies about $\frac{1}{2}$ mile SW. from the spindle.

See also dangers under paragraph I, foregoing.

2. From Boston Lighthouse through the Main Ship Channel to President Roads.—From a position $\frac{3}{4}$ mile south of Boston Lighthouse steer W. $\frac{1}{4}$ N., pass about 100 yards south of Nash Rock buoy (red, No. 8) and about 250 yards south of False Spit beacon, and as Spit beacon and Narrows Lighthouse are approached haul a little to the northward so as to pass from 100 to 200 yards to the southward of the lighthouse. Now with Narrows Lighthouse bearing N. distant about 200 yards steer NW. $\frac{1}{2}$ W. for Nix Mate beacon, until the eastern end of Gallup Island bears SW., then steer NW. by N.

On this course leave red buoy, No. 10, about 200 yards on the starboard hand and Nix Mate bell buoy about the same distance on the port hand. When past the bell buoy, haul to the westward so as to pass about midway between Deer Island and Long Island Head lighthouses, then steer W. $\frac{1}{4}$ N. and follow the directions in section 3 following.

If desiring to anchor in President Roads, when $\frac{1}{2}$ mile to the southward of Deer Island Lighthouse steer about WNW. and anchor with that lighthouse bearing about E. by S. distant $\frac{1}{2}$ to $1\frac{1}{4}$ miles.

Remarks.—The sailing line carries 23 feet of water.

The W. $\frac{1}{4}$ N. course leads close to the southward of Nash Rock buoy (red, No. 8) and about 250 yards to the southward of False Spit beacon. A number of buoys will be seen to the southward when nearly up to False Spit beacon, and the course leads about 300 yards to the northward of the northernmost buoy (black, No. 5), and about the same distance to the northward of Georges Island Rocks buoy (black, No. 7).

In passing through the southern part of The Narrows care must be taken to avoid being set out of the channel by the tidal currents (see pages 44–45).

A black gas-lighted buoy is moored just inside the bell buoy off Nix Mate. In winter when the buoy is endangered by ice it will be removed.

On the NW. by N. course the flagstaff on Deer Island should be nearly ahead and Deer Island Lighthouse a little on the port bow; Nix Mate beacon and the black bell buoy marking Nix Mate will be on the port bow and the red buoy, marking Seventy-four Bar, on the starboard bow.

Dangers.—Nash Rock has 20 feet over it and lies $\frac{3}{4}$ mile SW. Westerly from Boston Lighthouse; it is marked off its southern side by a buoy (red, No. 8). A spot with 18 feet over it lies about 150 yards to the northward of this rock.

A spot with 34 fathoms over it lies nearly $\frac{3}{4}$ mile S. by W. from Boston Lighthouse.

Hunt Ledge, a small detached spot with 14 feet over it, lies nearly $\frac{1}{2}$ mile SE. $\frac{1}{2}$ S. from Narrows Lighthouse; it is marked by a buoy (red and black horizontal stripes). There is good water between this buoy and the black buoy to the southward.

Spit or Brewster Bar and Kelp Ledges extend from Narrows Lighthouse to Boston Lighthouse on the north side of the channel. At low water the whole of the bar shows bare; near its western end is Narrows Lighthouse, to the eastward of which are two stone beacons placed on the dry part of the spit. The easternmost is known as False Spit beacon and the one near the lighthouse as Spit beacon.

Centurion Rocks have 14 feet over them and lie a little over $\frac{1}{2}$ mile S. by W. $\frac{1}{2}$ W. from False Spit beacon; they are marked on the north end by a buoy (black No. 5), and on the south end by another buoy (red, No. 2).

Georges Island Rocks make off for a distance of 600 yards to the eastward from Georges Island; they are marked by a buoy (black, No. 7) at their eastern end. A large part of the shoal on the east side of Georges Island is dry at low water.

Nix Mate is a large rocky shoal, partly bare at low water, lying to the northward of Gallup Island. Near the middle of its dry part is a large beacon with a square granite base and wooden octagonal pyramid on top. The northeastern end of this shoal is marked by a black buoy and about 75 yards southward from this buoy is a black bell buoy; on the northernmost end is a buoy (black, No. 11).

Seventy-four Bar makes to the westward from the northern end of Lovell Island; it is partly bare at low water and is marked on its western side by a buoy (red, No. 10).

3. From President Roads to the City of Boston by the Main Ship Channel.—With Deer Island Lighthouse bearing N. distant $\frac{1}{4}$ mile, steer W. $\frac{3}{4}$ N. until the dome of the State House is in range with the northeast end of Castle Island, then steer NW. $\frac{1}{2}$ N. until the northwestern edge of Governors Island is in range with the northwestern edge of Apple Island, bearing about E. $\frac{3}{4}$ N. Now steer about NW. by W. up to the city, hauling to the northward (course about N. by W. $\frac{1}{2}$ W. as the wharves of the city are approached). Anchor within the limits (see Appendix I) prescribed by the harbor master.

If bound up the Charles River, continue the NW. by W. course until nearly on a line between the elevators in South Boston and East Boston, then haul to the northward heading for the tall chimney in the Navy Yard and favoring the port hand shore (course about N. by W. $\frac{1}{2}$ W.).

When nearly up to the Navy Yard, follow the turn in the port hand shore and anchor below the bridge as close as practicable to the wharves on the south side. (See page 42.)

If bound to Chelsea or up the Mystic River, continue the NW. by W. course and when nearly on a line between the elevators in South Boston and East Boston, haul to the northward; follow the wharves on the starboard hand, giving them a berth of about 150 yards. A stranger should take a towboat to pass through the bridges, of Chelsea or Mystic rivers.

Remarks.—The W. $\frac{1}{4}$ N. course leads a little over $\frac{1}{2}$ mile north of Long and Spectacle islands. Fort Independence, a granite structure on Castle Island, will be on the starboard bow and the gilded dome of the State house will be seen to the northward of the fort. To the southeastward of the fort is a buoy (black, No. 7) which should be left about 350 yards on the port hand. When the dome of the State house is in range with the wharf on the northeast end of Castle Island, the western end of Spectacle Island should bear about S. $\frac{1}{4}$ E. On the NW. $\frac{1}{4}$ N. course the three red buoys on the eastern edge of the channel should be left about 100 yards on the starboard hand; the black lighted buoy on the Upper Middle should be left about 100 yards on the port hand. Apple Island and Governors Island are described on page 41.

From Castle Island to the point where the course is changed to NW. by W. the channel is narrow, being only 200 to 300 yards wide. When abreast the elevators in South Boston, the Fort Point Channel, leading into South Bay, will be opened to the southwestward. It is advisable for vessels going alongside the wharves to take a towboat. No vessel propelled by steam is permitted to pass within 100 yards of the wharves at a greater speed than 5 knots.

Dangers.—Shoals make off to the northward from Long and Spectacle islands for a distance of 200 yards.

Lower Middle is a shoal partly bare at low water, about 1 mile long in an ESE. and WNW. direction, lying to the eastward of Fort Independence on the northern side of the Main Ship Channel. Its eastern extremity is marked by a buoy (red, No. 6) and its channel side is marked by two buoys (red, Nos. 8 and 10).

Governors Island Flats are described under section 3 A.

Castle Rocks extend to the eastward from Castle Island and show partly bare at low water; near their eastern end they are marked by a buoy (black, No. 7). The northeastern end of Castle Island, near the wharf, is comparatively bold to.

Shoal ground extends nearly $\frac{1}{2}$ mile to the southward from the southern end of Governors Island; and is marked at its southern end by a buoy (red, No. 12). From this buoy the edge of the shoal, extending to the

southwestward from Governors Island, runs about $\frac{1}{2}$ mile NW. $\frac{1}{4}$ N. along the channel. The black buoy at the western extremity of the shoal marks the channel between it and Bird Island Flats, and should be left at least 250 yards on the starboard hand by vessels in the Main Ship Channel.

South Boston or Dorchester Flats make out from South Boston to the northward and eastward; the channel edge of these flats extends from the northern end of Castle Island about $\frac{1}{2}$ mile in a NNW. direction to the black lighted buoy, $\frac{1}{2}$ mile in a NW. $\frac{1}{4}$ N. direction and thence in a NW. by W. direction to the wharves east of Fort Point Channel. Upper Middle is on the northeastern edge of South Boston Flats nearly $\frac{1}{4}$ mile NNW. from Fort Independence; it has a depth of 4 feet over it and is marked at its eastern edge by a buoy (black, surmounted by lens lantern, showing a white light at night. This buoy is taken up when endangered by ice).

Slate Ledge, bare at very low water, is on the northern edge of South Boston Flats and just to the eastward of the wharves at the entrance to Fort Point Channel. Its northern edge is marked by black buoy No. 11.

Bird Island Flats, a large area of which is dry at low water, lie between the wharves of East Boston and Governors Island and extend to the edge of the channel. Near their southeastern end, where there is a channel to pass north of Governors Island, is a buoy (red, No. 12) and 150 yards N. of the buoy a spindle (iron, with cage on top, red).

3 A. *From President Roads through Governors Island Channel to the City of Boston.*—This channel is narrow and tortuous near its western end and is little used by strangers; 19 feet can be carried through if the buoys are closely followed.

With Deer Island Lighthouse bearing N., distant $\frac{1}{4}$ mile, steer NW. by W. $1\frac{1}{4}$ miles. Pass about 100 yards south of the red buoys 2 and 4, on the Middle Ground, and when the latter buoy is abeam haul to the northward so as to pass about 100 yards northeast of the black buoy No. 1, and then steer NW. $\frac{1}{2}$ W. This course leads close to the southward of the buoy (red, No. 8) marking Apple Island Flats. When past red buoy, No. 8, haul a little to the northward and leave black buoy, No. 3, on the port hand, and when nearly up to red buoy, No. 10, which should be seen ahead, haul sharply to the southward and steer about SW. by S., and leave black buoy, No. 5, on the port hand and Bird Island Flats beacon and red buoy, No. 12, about 125 yards on the starboard hand, and black buoy, No. 7, about the same distance on the port hand. When buoy No. 7 is on the port beam steer W. $\frac{1}{4}$ N. about $\frac{3}{4}$ mile until in the middle of the Main Ship Channel, then haul to the northward (course about NW. by W.) and stand up the harbor, and as the wharves are approached haul more to the northward and anchor within the limits prescribed in the harbor regulations (see Appendix I).

Remarks.—Vessels of less than 15 feet draught may bring Deer Island Lighthouse to bear SE. by E. and steer NW. by W., passing about 300 yards to the northward of red buoys No. 2 and 4. The channel is well buoyed and the buoys should be closely followed.

On the NW. $\frac{1}{4}$ W. course Bunker Hill Monument will be nearly ahead, but will be brought a little on the port bow after passing red buoy, No. 8.

Dangers.—A shoal with 7 to 17 feet over it, called the Middle Ground lies $\frac{1}{2}$ mile W NW. from Deer Island Lighthouse; it is $\frac{1}{2}$ mile long in a W NW. and E SE. direction and has a greatest width of about 300 yards, near its eastern end. A buoy (red, No. 2) marks the shoal near the middle at its southern side, and a buoy (red, No. 4) marks its western extremity. Between buoy No. 4 and Governors Island Flats to the westward a channel 300 yards wide leads from President Roads into Governors Island Channel.

Governors Island Flats, partly dry at low water, extend $1\frac{1}{4}$ miles in a SE. by E. direction from the eastern shore of Governors Island. A buoy (red, No. 2) marks the flats at their southeastern edge and a buoy (black, No. 1) at their northeastern extremity.

Deer Island Flats make out from the western shore of Deer Island. They have a depth of 3 to 10 feet over them and extend a little over $\frac{1}{2}$ mile W SW. $\frac{1}{4}$ W. from the northwestern point of Deer Island; a depth of 4 feet is found near the western extremity of these flats.

Apple Island Flats is the name given to the mud flats surrounding Apple Island. The greater part is dry at low water and the southern edge rises abruptly from the deep water of Governors Island Channel. A buoy (red, No. 8) marks their southern edge a little over $\frac{1}{2}$ mile W SW. from Apple Island, and from here the edge of the flats makes $\frac{1}{2}$ mile in an E SE. direction to red buoy No. 6, which marks their southeastern point, $\frac{1}{2}$ mile SE. by S. from Apple Island. A channel about 200 yards wide, leading up to Shirley Gut, makes between this buoy and Deer Island Flats to the eastward. A narrow spit, with 3 feet near its outer point, makes out a little over $\frac{1}{4}$ mile W. by N. from Apple Island.

Noddle Island Flats, partly dry at low water, make out from the southeastern point of East Boston in an E SE. direction to a point about 400 yards north of Apple Island. A buoy (red, No. 10) marks the southernmost point of this shoal.

A very narrow channel leads from Governors Island Channel north of Apple Island along the southeastern edge of Noddle Island Flats.

Shoals make out about $\frac{1}{2}$ mile to the northward and westward from the western end of Governors Island. They are marked at the northern end by a buoy (black, No. 3), at the northwestern side by a buoy (black, No. 5), and near the western point by a buoy (black, No. 7).

These buoys will be left close to on the port hand. That part of the shoals which is dry at low water is known as Glade Flats.

1 A. *Approaching and Entering through Broad Sound South Channel to President Roads.*—

While Egg Rock Lighthouse is bearing to the westward of N. by W. $\frac{1}{4}$ W., bring Long Island Head Lighthouse to bear W SW. Southerly and steer for it on this bearing. The whistling buoy to the northeastward of The Graves should be made right ahead and left on the port hand. Continue the W SW. course until nearly up to Devil Back buoy (black, No. 1), which should be made on the port bow, when haul a little to the southward and steer so as to leave it 150 yards on the port hand. From this buoy steer about SW. by W. $\frac{1}{4}$ W., so as to pass 150 yards to the northward of black buoy (No. 3) which will be seen on the port bow, then steer W SW. $\frac{1}{4}$ W., and pass 150 yards to the northward of Ram Head buoy (black, No. 5). From buoy No. 5, steer W. $\frac{3}{4}$ S. so as to pass $\frac{1}{2}$ mile south of Deer Island Lighthouse, and when the lighthouse bears N. steer W. $\frac{3}{4}$ N., and follow the directions under section 3, page 47.

If desiring to anchor in President Roads, steer W NW., and anchor anywhere from $\frac{1}{2}$ to $1\frac{1}{2}$ miles to the westward of Deer Island Lighthouse.

Remarks.—On the W SW. course Deer Island Lighthouse will be a little on the starboard bow and Nix Mate beacon on the port bow. Green Island, with an extensive ledge making off to the southwestward from it, lies on the south side of the channel and should be left at least $\frac{1}{2}$ mile on the port hand. A number of islands (described on page 41) lying between this and the Main Ship Channel will be seen to the southward. In passing black buoy, No. 3, care should be taken not to be set on Aldridge Ledge by the ebb current. The eastern ends of Great Faun and Little Faun bars extend to the channel, leaving it only 275 yards wide abreast Ram Head buoy. The best water is carried by closely following the buoys. On the W. $\frac{3}{4}$ S. course the northern Spectacle Island will be ahead.

Dangers.—The Graves are described on page 45.

Mamit Ledge, a small detached spot with 18 feet over it, lies about $\frac{1}{2}$ mile N NW. $\frac{1}{4}$ W. from Green Island.

Roaring Bulls are a number of detached rocks extending about 700 yards in an ENE. and W SW. direction and several of them show bare at low water of spring tides.

Their southwestern end lies $\frac{1}{2}$ mile E. from Green Island and their northeastern end about $\frac{1}{2}$ mile SW. by W. from The Graves.

Commissioners Ledge, a small detached ledge with 15 feet over it, lies nearly $\frac{1}{2}$ mile NW. by W. $\frac{1}{4}$ W. from the northern end of Green Island. To avoid this ledge, Long Island Head Lighthouse should be kept bearing a little to the southward of W SW. until within less than $\frac{1}{2}$ mile of Devil Back buoy.

Great Faun and Little Faun bars are described under section 1 B, following. An 8-foot spot lies near the eastern extremity of Little Faun Bar, $1\frac{1}{2}$ mile E. $\frac{1}{4}$ N. from Deer Island Lighthouse and about $\frac{1}{2}$ mile N. by W. from Ram Head buoy (black, No. 5).

There are a number of detached 17 and 18 feet spots lying to the eastward of these bars on the northern edge of the Broad Sound South Channel.

Devil Back is between 300 and 400 yards long and bare in places at low water; it lies nearly $\frac{1}{2}$ mile W. from Green Island and is marked on its north end by a buoy (black, No. 1).

Aldridge Ledge has 3 feet over it at its western end, and lies $1\frac{1}{2}$ miles N NE. from Narrows Lighthouse and $1\frac{1}{2}$ miles E. from Deer Island Lighthouse. Near the northwestern side is a buoy (black, No. 3).

Ram Head is the extensive shoal making off to the northeastward from Lovell Island; a large part of this shoal is bare at low water, and only 9 feet of water is found $\frac{1}{2}$ mile from the island. On its northern side the shoal is marked by a buoy (black, No. 5).

Deer Island Point is described under section 1 B, page 50.

Nix Mate is described under section 2, page 47.

1 B. *Approaching and Entering through Broad Sound North Channel to President Roads.*—

I. *Coming from Lynn Harbor or Nahant.**—Stand to the southward, keeping well off the entrance until Deer Island Lighthouse bears WSW. $\frac{1}{4}$ W., when steer for it on that bearing, leaving the bell buoy and red buoy, No. 4, about 30 yards on the starboard hand. When up to red buoy No. 4, steer for Long Island Head Lighthouse on a bearing SW., and when Deer Island Lighthouse bears N NW. steer W. $\frac{3}{4}$ N. and follow the directions under section 3, page 47, or steer about W NW. $\frac{1}{4}$ W. and anchor anywhere from $\frac{1}{2}$ to $1\frac{1}{2}$ miles to the westward of Deer Island Lighthouse.

Remarks.—When approaching Great Faun bar bell buoy, the beacon on Great Faun Bar will be seen to the westward of the buoy. The black buoys marking the southern edge of Broad Sound South Channel will be seen to the southward. As Deer Island and Long Island lighthouses are approached Nix Mate beacon and the buoys at the northwestern end of the Main Ship Channel will be seen to the southward.

Vessels of 15 feet or less draught can at high water with a smooth sea stand directly in for Long Island Head Lighthouse bearing SW. by W. $\frac{1}{4}$ W.

Dangers.—Great Faun Bar extends to the eastward from the middle of Deer Island for a distance of nearly $\frac{1}{2}$ mile, where it is marked by a beacon (square stone base and cone, with iron spindle and cage on top); the bar is dry at low water. The shoal water extends a distance of 1 mile to the eastward of the beacon and a red bell buoy is placed $\frac{1}{2}$ mile to the eastward of the beacon as a guide over the bar, where the least depth is 11 to 12 feet.

* Steamers of less than 15 feet draught, whose masters are well acquainted with the locality, sometimes use Shirley Gut.

Little Faun Bar makes off to the eastward from near the southern end of Deer Island. A buoy (red, No. 4) is placed on a part of the bar having 13 feet over it and about $\frac{1}{2}$ mile to the eastward of the island. The bar is partly dry between the buoy and the shore, and has least depths of 8 to 11 feet to the eastward of the buoy.

Deer Island Point is a long spit, dry at low water, extending nearly $\frac{1}{2}$ mile to the southward from the southern end of Deer Island. Near its southern end it is marked by Deer Island Lighthouse (see table, page 10). About 225 yards E. by S. from the lighthouse is a rock awash at low water, and shoals extend from the lighthouse to Little Faun Bar.

II. Coming from the northeastward.—When Long Island Head Lighthouse is made, bring it (while still well off the entrance) to bear SW. by W. $\frac{1}{4}$ W. and steer for it until Deer Island Lighthouse bears W SW. $\frac{1}{4}$ W. Now steer for Deer Island Lighthouse, keeping it bearing W SW. $\frac{1}{4}$ W. until up to Great Faun Bar bell buoy, from which follow the directions given in paragraph I, foregoing.

Remarks.—In approaching on the SW. by W. $\frac{1}{4}$ W. course for Long Island Head Lighthouse, a black whistling buoy to the northeastward of The Graves will be left about $\frac{1}{2}$ mile on the port hand.

See also the remarks and dangers under paragraph I, foregoing.

The Graves are described under section I, page 45.

1 C. From the Main Channel Entrance to an Anchorage in Nantasket Roads.—Having followed the directions in section 1, paragraphs I or II, page 45, and when about $\frac{3}{4}$ mile south of Boston Lighthouse, steer W. $\frac{1}{4}$ N. until the range beacon to the southward of Boston Lighthouse is in range with the lighthouse; then steer SW. by W. $\frac{3}{4}$ W., keeping the lighthouse and beacon in range over the stern. When Long Island Head Lighthouse bears NW. $\frac{1}{2}$ N. steer for it on that bearing and anchor anywhere when on this bearing, with Narrows Lighthouse bearing between N NE. and E. by S. The best anchorage is in $3\frac{1}{2}$ to 5 fathoms, just to the westward of Georges Island.

At night.—Steer W. $\frac{1}{4}$ N. until the first red sector of Boston Light (auxiliary light) is crossed; then stand SW. by W. $\frac{3}{4}$ W., keeping in the white rays of the auxiliary light until Long Island Head Light bears NW. $\frac{1}{2}$ N., when steer for it and anchor to the westward of Georges Island and southward of Gallup Island.

Remarks.—On the SW. by W. $\frac{3}{4}$ W. course the northwestern end of Peddock Island will be ahead and three red buoys (Nos. 2, 4, and 6) will be left on the starboard hand and a red and black horizontal striped buoy and black buoy on the port hand. When past these buoys Nantasket Gut will be opened out between Peddock Island and Windmill Point. The white rays of the auxiliary light can be seen only when in the channel for Nantasket Roads.

Dangers.—Nash Rock, Centurion, and Hunt Ledge are described on page 47.

A spot with 13 feet over it and marked by red buoy No. 6, lies $\frac{1}{2}$ mile S SW. from Narrows Lighthouse.

Hospital Shoal, with a least depth of 6 feet on it, lies $\frac{1}{2}$ mile W SW. $\frac{1}{4}$ W. from Georges Island, and is marked on its eastern side by a buoy (black, No. 1).

2 C. From an Anchorage in Nantasket Roads or to the Westward of Georges Island to President Roads.—I. **To pass between Georges and Gallup Islands.**—Stand to the northeastward, giving the eastern point of Gallup Island a berth of 100 to 300 yards on the port hand; when past this point haul sharply to the northward and westward and steer about NW. by N. with Deer Island Lighthouse a little on the port bow. When well past the bell buoy and Nix Mate beacon, steer W. $\frac{1}{4}$ N. into President Roads, and if bound up to the city follow the directions in section 3, page 47.

II. **To pass through the dredged channel between Long Island and Nix Mate.**—Steer for Long Island Head Lighthouse on a bearing of NW. $\frac{1}{2}$ N. until Deer Island Lighthouse bears N. $\frac{3}{4}$ W., then steer for it on the bearing until up to red buoy No. 2. When up to this buoy leave it 30 yards on the starboard hand and steer N NW., leaving black buoys Nos. 1 and 3 on the port hand and red buoy No. 4 on the starboard hand. Continue the N NW. course until about midway between Long Island Head and Deer Island lighthouses; then if bound to the city follow the directions in section 3, page 47.

Remarks.—The channel between Long Island Head and Nix Mate is only about 200 feet wide and 15 feet deep, and the buoys marking it are small spars.

NEPONSET RIVER*

is the first river emptying into Boston Harbor to the southward of South Boston, and leads to Neponset, 1 mile above its mouth, and thence to Milton Mills, about 2 miles farther up the river. It is narrow and crooked, the approaches are dangerous, and it is not considered safe for strangers to enter without a pilot. The river is $\frac{1}{2}$ mile wide at its mouth, but grows gradually narrower until, at Milton Mills, it is only 100 yards in width. Milton is $2\frac{1}{2}$ miles above the mouth of the river in a straight line, but nearly $3\frac{1}{2}$ miles by the windings of the river. The

* Shown on chart 237, scale $\frac{1}{40,000}$, price 30.50. See footnote on page 2.

southern boundary of the city of Boston extends to the western bank of the Neponset River. At mean low water the least depth in the channel as far up as **Commercial Point**, the first landing on the river, is 10 feet; as far as Neponset 7 feet; and to Milton, the head of navigation, 4 feet. The greatest draught, when laden, of the vessels entering the river is 15 feet; the greatest draught taken up to Milton is 12 feet.

The channel below Neponset is buoyed. At Neponset, where the first bridge crosses the river, there are shifting, middle grounds, and above the third or granite bridge there are rocks along the edge of the channel.

Pilots are generally taken by strangers and may be had by making signal off Thompson Island, at the mouth of the river, anchoring there if necessary; they are not always taken by light draught vessels bound to Neponset. Pilotage is not compulsory; the rates for the lower part of the river are given in Appendix I.

Towboats are taken by most vessels in going up and down the river, the master of the tug doing the piloting below Neponset bridge, where, if bound to Milton, a special pilot is taken and the vessel being towed pays his pilotage.

The Harbor regulations, etc., are the same as for Boston Harbor (see page 43 and Appendix I).

Ice forms over the river in winter, extending to its mouth and beyond.

The Tidal currents set fair with the direction of the channel, as a rule, below Neponset; above this the currents are irregular.

SAILING DIRECTIONS, NEPONSET RIVER.

The following directions will lead to an anchorage to the westward of Thompson Island with a least depth of 12 feet at low water. Here a pilot or towboat should be taken by strangers bound up the river.

From President Roads to the Anchorage.—Having entered Boston Harbor by the directions on pages 45, 46, and 49, and when on the **W. $\frac{3}{4}$ N.** course through President Roads the western end of Spectacle Island bears **S SW.**, steer **SW.** by **W. $\frac{1}{2}$ W.** Leave Old Harbor Shoals buoy (red, No. 2) about 100 yards on the starboard hand and steer **W SW. $\frac{1}{2}$ W.** and pass about midway between Old Harbor buoy (red, No. 4) and Thompson Island Flats buoy (black, No. 1). When abreast these buoys steer about **SW. $\frac{1}{4}$ W.** and anchor in 14 to 17 feet water to the northeastward of Cow Pasture Flats buoy (red, No. 6).

Remarks.—The channel leads between shoals with 2 and 3 feet over them at low water. The only guides easily recognized by a stranger are the buoys. On the **SW. by W. $\frac{1}{2}$ W.** course red buoy No. 2 should be made a little on the starboard bow and Spectacle Island will be left nearly $\frac{1}{2}$ mile on the port hand; Commercial Point will be ahead. On the **W SW. $\frac{1}{2}$ W.** course Savin Hill will be on the starboard bow and the northern shore of Thompson Island will be left about 250 yards on the port hand. On the **SW. $\frac{1}{4}$ W.** course red buoy No. 6 will be a little on the starboard bow.

QUINCY BAY.*

This large but shallow bay indents the southern shore of Boston Harbor to the eastward of Neponset River. On the west it is separated from that river by the peninsula of Squantum, and on the east Hough Neck separates it from Weymouth Fore River. Its shores are mostly low and gently sloping towards the water, but high, steep hills will appear behind and over the low lands; the highest summits are those of Forbes Hill and Mount Wollaston. The town of Quincy is situated about 1 mile inland from the shores of the bay, near its eastern end. It has no communication by water with the bay, but there is a small frontage on a narrow stream emptying into Town River Bay.

The peninsula of Squantum extends out from the mainland about 1 mile in an **E NE.** direction and has a general width of about $\frac{1}{2}$ mile. It is bare of trees and hilly with exception of its western end, where it joins the mainland, which is almost entirely composed of salt meadows.

To the eastward of Squantum and connected with the peninsula by an artificial isthmus lies Moon Island. It is a narrow island, easily recognized by the precipitous head on its eastern end.

To the eastward of Moon Island, and between it and the southwestern end of Long Island, lies the entrance to Quincy Bay from the westward. From here the Back or Western Way leads in a **NNW.** direction between Spectacle islands and Thompson Island into the Main Ship Channel, and the Sculping Ledge Channel in a **NE.** direction following closely the western shore of Long Island into President Roads.

Hough Neck extends out from the mainland about $1\frac{1}{4}$ miles in a general **N NE.** direction. It is of irregular shape and moderate height, has a smooth surface, and its eastern slope is covered with houses. At its northeastern end it terminates in a smooth, green hill 100 feet high, with precipitous faces, called Quincy Great Hill.

About 200 yards to the northward of Hough Neck and connected with it at low water lies Nut Island, a small bare islet with a precipitous faces on its northern side. The channel into Weymouth passes between this island and Peddock Island. Hangmans Island is a small, rocky islet lying in the bay nearly midway between Moon Island and Nut Island; on it are several fishing huts.

* See footnote on page 40.

HINGHAM BAY—WEYMOUTH FORE RIVER.

HINGHAM BAY AND TRIBUTARIES.*

HINGHAM BAY

is that part of Boston Harbor lying to the southeastward of Peddock Island and to the southward of the shore running west from Point Allerton to Windmill Point; on the east it is separated from Boston Bay by Nantasket Beach. It is the approach to its tributaries, Weymouth Fore River, Weymouth Back River, Hingham Harbor, and Weir River. The eastern part of the bay is shoal, and extensive shoals, between which the narrow channels of the tributaries of the bay lead, make out from the southern shore and surround the islands in the southern part of the bay.

Sheep Island is a small, low, bare islet with a hut on top of it, and lies near the middle of the bay about $1\frac{1}{2}$ miles S W. from Windmill Point; it is surrounded by a nearly circular shoal about $\frac{1}{2}$ mile in diameter.

Grape Island lies near the southern shore of the bay, less than $\frac{1}{2}$ mile from Lower Neck, the northern point of the peninsula between Weymouth Back River and Weymouth Fore River. The island is about $\frac{1}{2}$ mile long E. and W. and has a saddle-shaped appearance from the northward, with a house standing in the hollow near the middle.

Slate Island is a small island which lies 200 yards to the eastward of, and is connected at low water with, Grape Island.

Bumkin Island lies $\frac{1}{2}$ mile ENE. from Grape Island. It is $\frac{3}{4}$ mile long in a ESE. and WNW. direction, is about 60 feet high and bare of trees. A narrow shoal spit extends nearly $\frac{1}{2}$ mile NW. from the northwestern end of the island.

Little Hog Island is a small island in the northeastern part of the bay. The bight to the northeastward of it is very shoal, and shoals with 4 to 6 feet extend in a SE. and NW. direction from the island to the shore.

The principal entrance, **Nantasket Gut**, is a narrow but deep channel between the northeastern end of Peddock Island and Windmill Point and leads directly from Nantasket Roads into the bay. Prominent on Windmill Point is a large hotel, with steamboat landing to the southward. This is the terminus of the Nantasket Beach Railroad. To the eastward, on the slopes of the hills, is the town of Hull and the clubhouses of the Hull Yacht clubs. The usual and best anchorage is off the steamboat landings at Hull. There is also an entrance to the southward of Peddock Island; this is sometimes used by vessels bound into Weymouth Fore or Weymouth Back rivers.

The tidal currents in Nantasket Gut run with considerable velocity, but generally follow the direction of the channel. The flood sets to the southward and the ebb to the northward.

Sailing directions for entering the bay are given in connection with its tributaries.

WEYMOUTH FORE RIVER

empties into Hingham Bay to the eastward of Hough Neck, Quincy Great Hill being on the western side of the entrance and Grape Island on the eastern. It is quite wide at its mouth, but above is very variable in width and is somewhat crooked but extends in a general SW. direction for about 4 miles to Weymouth Landing and East Braintree, near the head of navigation. About $2\frac{1}{2}$ miles above its mouth it is crossed by Quincy bridge (width of draw 36.7 feet) and at East Braintree by another bridge (width of draw 35 feet).

It is the approach by water to Quincy, Weymouth Landing, and East Braintree, and to a number of landings on its banks.

The channel is narrow and crooked, but at low water 14 feet can be carried to a point a little above Quincy bridge abreast Braintree (Quincy) Neck, and 6 feet thence to Quag Rocks (a little below East Braintree), and thence about 3 feet to the Old Colony Railroad bridge at the head of navigation.

In April, 1891, work was begun under the supervision of the United States Engineers to improve the channel. It is proposed to dredge a channel so that 6 feet can be carried at low water to the head of navigation, the channel to have a least width of 100 feet to near the wharves at Weymouth Landing, and thence a width of 50 to 80 feet to the head of navigation.

Town River Bay makes in on the northwestern shore of Weymouth Fore River north of the village of Quincy Point. It is very shoal generally, but has some deep holes, and is not safe for strangers. On its northern side is a large but shallow cove, called **Sailors' Snug Harbor**, which is dry at low water. Town River empties into the bay nearly 1 mile above Quincy Point; it is a small creek, very crooked and extremely shoal. It is proposed to improve the channel through the bay and river so that 4 feet may be taken at low water to the landings at Quincy.

Pilots are always taken by vessels going up Weymouth Fore River above Quincy bridge, and are obtained either at Nantasket Gut or at Quincy Point; in the former case, after making signal, vessels anchor between Nantasket Gut and Sheep Island, if it is necessary to wait for a pilot.

Towboats are always employed by the large vessels entering the river, being generally taken from Nantasket Roads; light draught vessels sometimes sail up if the wind is fair.

Supplies and provisions can be obtained at Quincy, Weymouth, and East Braintree. Fresh water can be had at Quincy Point and at Weymouth Landing, alongside of wharves.

* See footnote on page 40.

Ice.—The river freezes over down to Quincy Point, and in extremely cold winters the ice extends as far as Hull.
Tides.—The mean rise and fall of tides is about 9 feet.

WEYMOUTH BACK RIVER

empties into Hingham Bay just to the eastward of Weymouth Fore River, from which it is separated by Lower and Eastern necks; it is narrow, crooked, and shallow, about 3 miles in length, and of little commercial importance. Directly across its mouth lie Grape and Slate islands, which are connected at low water.

Two channels lead into the river, one, with a depth of 5 feet, from the eastward to the southward of Slate Island; the other, with a depth of 18 feet, from the westward to the southward of Grape Island; the latter channel is buoyed, and is the one used. The channel is very narrow, but about 7 feet at low water can be carried up to Bradley Fertilizer Company's wharves, which may be considered the head of navigation.

Vessels entering this river, unless well acquainted, should take a pilot.

For directions in approaching see the sailing directions for Weymouth Fore River.

HINGHAM HARBOR AND WEIR RIVER

are shallow, irregular bodies of water making into the mainland in the southeastern corner of Hingham Bay.

Their common entrance from the bay lies to the westward and leads close to Bumkin Island. The channel, 250 yards wide, and having a depth of over 3 fathoms abreast the western end of Bumkin Island, leads for $\frac{1}{2}$ mile in a southeast direction to a point abreast of White Head Flats buoy (black, No. 3) to the eastward, and East Crow Point Flats buoy (red, No. 2) to the westward. From here the channel shoals and branches; the channel leading to the eastward takes the name of Weir River; the channel leading to Hingham Harbor follows a general south direction and has a least depth of 13 feet up to Crow Point (Downer Landing), the entrance of the harbor.

Hingham Harbor is a cove 1 mile long, with an average width of about $\frac{1}{2}$ mile. At low water it is a dry flat, through which a narrow and tortuous channel winds, leading up to the long wharves built out from the southeastern shore at the town of Hingham.

The least depth in the channel at low water is 10 feet at the outer wharf, and 8 feet can be taken up to the next three wharves to the southward.

Crow Point (Downer Landing), the western point, at entrance to the harbor, is a high, bare hill with a steep face to the northward. A steamboat landing is built out from its eastern end to the edge of the channel.

Planters Hill, the eastern point at entrance to the harbor, is a high, smooth, grassy hill, with a few trees on top of it and a precipitous face on its western side, lying $\frac{1}{2}$ mile E. from Crow Point.

Three small islands lie just inside of the entrance of the harbor; the northern or outer one is Chandler Island, and the channel leads between it and Ragged Island and Sailor Island to the southward.

Weir River leads between World End, a high peninsula to the northward of Planter Hill, and a narrow spit of land making out about 1 mile to the westward from the south central part of Nantasket Beach, and then extends in a southeasterly direction for about $1\frac{1}{2}$ miles. It is more of an inlet than a river, and is composed mostly of extensive flats bare at low water, through which a narrow channel leads to Nantasket Pier on the western side and near the southern end of Nantasket Beach. This channel, as improved under the supervision of the United States Engineers, has a least width of 200 feet and least depth of $10\frac{1}{2}$ feet from the entrance to abreast Hampton Hill, a distance of about $1\frac{1}{2}$ miles, and thence to Nantasket Pier the width is 100 feet and depth $9\frac{1}{2}$ feet.

The channel is mostly used by vessels running from Boston to Nantasket Beach, and it is well marked by piles or stakes, but is so narrow that a stranger should not attempt it.

Directions for approaching the entrance are given in sailing directions, Hingham Harbor. The tidal data for Hingham Harbor and Weir River is about the same as for Boston Lighthouse (see page 22).

SAILING DIRECTIONS, HINGHAM BAY AND TRIBUTARIES.

1. From Nantasket Roads.—Follow the directions in section 1 C, page 50, until Nantasket Gut is opened, then haul to the southward and pass through it on a course about S. by E., giving Windmill Point a berth of 100 to 200 yards. When through Nantasket Gut good anchorage will be found to the southward and close under Windmill Point, or in 4 to 8 fathoms $\frac{1}{2}$ to $\frac{1}{2}$ mile to the southeastward of the northern end of Peddock Island.

If bound in to any of the tributaries of the bay, anchor and signal for a pilot or proceed according to destination as directed in paragraphs I or II, following.

I. From Hingham Bay into Weymouth Fore or Weymouth Back rivers.—When through Nantasket Gut bring the western end of Windmill Point to bear N NE. $\frac{1}{2}$ E. and steer S SW. $\frac{1}{2}$ W until Sheep Island bears SE. by E. $\frac{1}{2}$ E. distant about $\frac{1}{2}$ mile. Now change the course to S. $\frac{1}{2}$ E. for the western extremity of Grape Island, leave Sheep Island nearly $\frac{1}{2}$ mile on the port hand and when

its western extremity bears **NE. $\frac{1}{2}$ N.** steer **SW. $\frac{1}{2}$ S.** This course if made good will lead between the two buoys (black, No. 1 and red, No. 2) off Eastern Neck and up to the buoy (red and black horizontal stripes) on the eastern edge of the shoal making out from Gull Point. Leave the last mentioned buoy close-to on the starboard hand and steer **W. by S.** for about $\frac{1}{2}$ mile when anchor to the eastward of Germantown and about $\frac{1}{4}$ mile to the southward of Gull Point, in 15 to 25 feet of water. The least depth on the sailing lines to this point is 14 feet; farther up the channel is very crooked and local knowledge is necessary.

If bound into Weymouth Back River follow the direction above until about $\frac{3}{8}$ mile to the westward of Grape Island and abreast the entrance, when take a pilot.

Remarks.—On the **SSW. $\frac{1}{4}$ W.** course Sheep Island will be on the port bow and Pig Rock beacon on the starboard bow, and the latter will bear about **WSW. $\frac{1}{4}$ W.** when the course is changed to **S. $\frac{1}{4}$ E.**

Dangers.—Shoals make out nearly $\frac{3}{4}$ mile to the eastward and southeastward from the central part of Peddock Island; near the eastern part of the shoal are a group of rocks bare at low water, known as **Harry Rocks**; they lie a little over $\frac{1}{2}$ mile **NNW. $\frac{1}{4}$ W.** from Sheep Island. About $\frac{3}{4}$ mile **NW. $\frac{1}{4}$ W.** from the same island is a small island, known as **Prince Head**, which is off the south side of, and connected at low water with, Peddock Island. Shoal water extends about 400 yards to the southeastward from Prince Head.

A shoal, with 6 to 8 feet, surrounds Sheep Island; it extends about $\frac{3}{4}$ mile in a northeasterly and northerly direction from the island, and rises abruptly from depths of $3\frac{1}{2}$ and $4\frac{1}{2}$ fathoms. On the western side of Sheep Island 18 feet can be carried to within 300 yards of it.

Extensive shoal ground makes out to the northeastward and eastward from Hough Neck, a depth of only 7 feet being found $\frac{1}{2}$ mile to the eastward from Quincy Great Hill. A little over $\frac{1}{4}$ mile **ENE. $\frac{1}{4}$ E.** from this hill, and near the northern edge of the shoal is **Pig Rock**, marked by an open work beacon with granite base, surmounted by a black staff and cage.

The channel to the southward of Sheep Island leads between shoals on both sides, but a useful description of them cannot be given.

II. Through Hingham Bay to Hingham Harbor and Weir River entrances.—Entering Hingham Bay as directed in section 1, page 53, continue the **S. by E.** course, leaving Bumkin Island Shoal buoy (black, No. 1) about 200 yards on the port hand, and when it bears **N. by E. $\frac{1}{2}$ E.** steer **SE. $\frac{1}{4}$ S.** Pass 200 yards to the westward of Bumkin Island and continue the course for about $\frac{1}{2}$ mile, when you should be up to the red buoy (No. 2) marking the entrance to Hingham Harbor and the black buoy (No. 1) marking the entrance to Weir River, and should take a pilot.

Dangers.—**Bumkin Island Shoal** makes out for $\frac{1}{2}$ mile in a northwesterly direction from Bumkin Island and is marked at its extremity by a buoy (black, No. 1).

Crow Point Flats are very shoal and extend $1\frac{1}{2}$ miles in a northerly direction from Crow Point, their eastern edge forming the western edge of the channel into Hingham Harbor; the eastern edge of the channel is formed by the extensive flats making to the westward for $\frac{1}{2}$ mile from World End and Planter Hill.

1 A. Approaching and Entering Hingham Bay or Weymouth Fore River Coming from the North-westward and Passing S. of Peddock Island.—**I. Coming from Boston by the Backer Western Way.** The following directions are good for about 8 feet at low water. Reverse the courses given in section 3, page 47, for entering Boston Inner Harbor, and when abreast of Castle Rocks buoy (black, No. 7) haul to the southward, pass to the eastward of it and then bring that buoy to bear **N. by W. $\frac{1}{4}$ W.** Westerly and steer **S. by E. $\frac{1}{4}$ E.** Easterly for Quincy Great Hill, which will be about 4 miles off. This course leads between Thompson Island and Spectacle Island, leaving Thompson Island Flats on the starboard hand. Continue this course until the southern extremity of Long Island bears **E. by S.** when steer **SSE. $\frac{1}{2}$ E.**

Pass about midway between Hangmans Island and Sunken Ledge beacon and about $\frac{1}{2}$ mile to the eastward of Wreck Rock buoy (red, No. 4), continue the **SSE. $\frac{1}{2}$ E.** course past the latter buoy until a little less than $\frac{1}{2}$ mile to the northward of Nut Island, when steer for Sheep Island bearing **ESE. $\frac{1}{4}$ E.** and leave Pig Rock beacon about 300 yards on the starboard hand.

If bound into Weymouth Fore or Weymouth Back rivers continue the **ESE. $\frac{1}{4}$ E.** course for Sheep Island until the western extremity of Grape Island bears **S. $\frac{1}{4}$ E.**, when steer for it and follow the directions in paragraph I, page 53.

If bound into Hingham Bay, when Pig Rock beacon bears **SW. by W.** Westerly steer **NE. by E.** Easterly keeping the beacon on a bearing astern. Then if bound into Hingham Harbor or Weir River, steer for Bumkin Island Shoal buoy (black, No. 1) when it bears **E.**, and when within less than 400 yards of it steer **SE. $\frac{1}{4}$ S.** and follow the directions in paragraph II, above.

See dangers under paragraph II, following.

II. Coming from President Roads by the Sculpin Ledge Channel.—With the wharf near the hotel on the western side of Long Island bearing between S. by W. $\frac{1}{2}$ W. and SE. $\frac{1}{2}$ S. steer for it; as it is approached change the course so as to pass about 250 yards to the westward of it and then steer SW. $\frac{1}{2}$ S. for Sculpin Ledge buoy (red, No. 2). Leave this buoy close-to on the starboard hand and steer SW. $\frac{3}{4}$ W. for Moon Head until within about 600 yards of it and the southwestern end of Long Island bears E. by S., when steer S SE. $\frac{1}{2}$ E. and follow the directions in paragraph I, foregoing.

Dangers.—The directions above (paragraphs I and II) are intended only for vessels of 8 feet or less draught, and a detailed description of all the shoals would be of no particular value.

Sculpin Ledge, a long reef, awash in places at low water, lies about midway between the southern end of Long Island and the southernmost of The Spectacles. Its eastern extremity is marked by Sculpin Ledge buoy (red, No. 2).

Sunken Ledge, dry at low water, and lying $\frac{1}{2}$ mile NW. $\frac{1}{2}$ W. from the southwestern end of Peddock Island, is marked by an open work beacon, with granite base, surmounted by a black staff and cage.

About $\frac{1}{2}$ mile W SW. $\frac{1}{2}$ W. from Sunken Ledge beacon is Hangmans Island, low, with several huts on it and bare rocks and shoals around it.

Wreck Rock, a sunken rock near the end of the rocky ledge making out about $\frac{1}{2}$ mile in a N NW. direction from Nut Island, is marked off its eastern side by a buoy (red, No. 4).

COHASSET HARBOR.*

The coast line from Point Allerton extends in a general S SE. direction a distance of nearly 3 miles and is known as Nantasket Beach; it is a low and narrow strip of land separating Boston Bay from Hingham Bay. There are three smooth and grassy hills on this beach, the most prominent of which is **Strawberry Hill** (about 1 mile to the southward of Point Allerton), which can be easily recognized by the tall, dark, round water tower on its top; the other two hills to the southward are **White Head** and **Sagamore Head**. Houses show scattered along the entire length of the beach. From Nantasket Beach the coast line presenting a general hilly appearance, although intersected by creeks and marshes, extends nearly 3 miles in a general E SE. direction to Cohasset Harbor. Rocks and sunken ledges are found $\frac{1}{2}$ mile off the shore along the coast between Nantasket Beach and Cohasset Harbor.

Cohasset Harbor is formed by a large but shallow cove of irregular shape which makes into the shore on the western side of Strawberry Point, the entrance lying $5\frac{1}{2}$ miles SE. from Point Allerton. The harbor is of little commercial importance.

Anchorage in 8 to 10 feet can be found in the so-called outer harbor, but the inner harbor is almost entirely composed of salt meadows through which a narrow channel, with 3 feet at mean low water, but only 1 foot over the bar, leads from the outer harbor to the wharves of Cohasset, situated on the southwestern shores of the harbor.

The most conspicuous object approaching this harbor is **Minots Ledge Lighthouse** (see page 10), built on the **Outer Minot**, the most northerly of the Cohasset Rocks.

Strawberry Point, the point on the eastern side of the harbor, is a low cleared point with houses scattered over its surface, and is a summer resort. Numerous bare and sunken ledges with a few bare islets surround this point and render a close approach to it hazardous.

Channels.—There are three channels, the entrances to which are marked by buoys; the **Western** or **Brush Island Channel**, which is the only one that should ever be attempted by strangers, enters between Brush Island Ledge and Chittenden Rock; the **Middle Channel**, leading between West Hogshead Rock and The Grampuses; and **Eastern Channel**, which leads between East Shag Rock and West Willies.

A pilot should always be taken by strangers desiring to enter this harbor, as the numerous bare and sunken ledges (extending out to Minots Ledge Lighthouse) at its entrance make it difficult for those well acquainted with the locality to pass through safely.

No sailing directions of value can be given; if forced to enter without a pilot, the chart and buoys must be the guides.

SCITUATE HARBOR.*

The coast line from Strawberry Point, on the eastern side of Cohasset Harbor, extends in a general S SE. direction for a distance of $3\frac{1}{2}$ miles to Cedar Point, the northern point at entrance to Scituate Harbor. Seen from the eastward it appears as undulating land of moderate height, thickly settled, dotted here and there with woods, but for the most part grassy and bare of trees.

The entire coast from abreast of Minots Ledge Lighthouse to Scituate Harbor is rendered extremely hazardous to navigation by the large number of rocks and detached ledges lying off it, and known under the general name of **Steelwagen Ledges**. Some of these sunken ledges lie over 1 mile from shore and have from 9 to 14 feet over them in a surrounding depth of 4 to 9 fathoms. While in this vicinity, strangers should keep over $1\frac{1}{2}$ miles from the shore while Scituate Tower bears to the southward of SW.

* See footnote on page 40.

SCITUATE HARBOR—GENERAL DIRECTIONS.

Scituate Harbor is about $4\frac{1}{2}$ miles to the southward of Cohasset Harbor and $12\frac{1}{2}$ miles to the northward of Plymouth Harbor. It is easy of access, but shallow, and affords limited anchorage. The greater part of the harbor is bare at low water.

The town of Scituate is at the southwestern end of the harbor; it has several wharves, which are dry at low water. Improvements of the harbor are in progress; a breakwater has been built extending about 250 yards in a SE. by S. direction from the southern end of Cedar Point, and a channel 100 feet wide and 5 feet deep has been dredged across the bar at the entrance to the anchorage basin, which is 350 by 400 feet and has a depth of 7 feet. A dredge channel, 25 feet wide and 1 foot deep, leads from the spindles to the wharves of the village.

The entrance to the harbor opens to the eastward and is between First Cliff, to the southward, and the breakwater extending out from Cedar Point, to the northward. A red lantern light, shown from a spar 36 feet high and near the outer end of the breakwater, is the guide to the entrance at night.

On the north point at the entrance is an old unused white light tower 44 feet high, which serves as day mark for vessels approaching the harbor, or standing along the coast, but as it is approached the white houses on the southern side of the entrance will show more prominently. The end of the breakwater is readily distinguished when standing in for the entrance. Inside the harbor are two spindles or beacons, which mark the channel to the wharves of the village.

Pilots may be obtained by lying-to off the entrance and making signal.

Provisions and water may be obtained at Scituate, which has railway communication with Boston.

Ice.—There is no danger from ice, the harbor being kept clear by the current. The tidal currents take the general course of the channel.

Tides.—The mean rise and fall of tides is about 9.8 feet.

GENERAL DIRECTIONS, SCITUATE HARBOR.

The following directions carry a depth of about 4 feet over the bar at low water. The best time to enter is just before high water.

If to the northward of the entrance, keep more than $1\frac{1}{2}$ miles from the shore while Scituate Tower bears to the southward of SW. Steer for the tower on any bearing between SW. through W. to N NW.

When $\frac{1}{2}$ mile from the shore bring the end of the north breakwater to bear W. by N.; steer for the end on this bearing and leave it 30 yards on the starboard hand. Continue the W. by N. course a short distance inside the breakwater and then steer for the two spindles which will be seen to the westward.

Anchor to the eastward of the spindles, or if bound to the village, steer between them and thence steer to the southwestward for the wharves.

COAST FROM SCITUATE TO PLYMOUTH.*

The coast line from Scituate Harbor to Gurnet Point (the northern point at entrance to Plymouth Harbor) trends in a general S. by E. direction for about 13 miles.

The shore from Scituate Harbor entrance to Green Harbor Point (Brant Point), a distance of nearly $7\frac{1}{2}$ miles, is composed of low lands, with here and there an isolated hill with precipitous sea faces backed by higher lands, diversified with woods and cleared fields and well settled.

From abreast of Green Harbor Point Duxbury Beach extends a distance of about $5\frac{1}{2}$ miles to Gurnet Point. For the most of this distance it is a mere strip of low, sandy beach separating Duxbury Bay from the sea.

Green Harbor Point is a low and flat headland with several higher patches of ground on which houses are built. There is quite a village here—the point having become a watering place. Green Harbor River has its entrance west of the point. It makes in a general NW. direction, is narrow and crooked and very shoal—being closed by a bar with less than 6 feet upon it.

North River (or Marshfield Harbor, as it is sometimes called, from the village on its bank) and South River have their common entrance 3 miles to the northward from Green Harbor Point.

North River is a shallow stream very narrow at its entrance, running in a N NW. direction, and is separated from the ocean by a narrow beach. The river widens about 2 miles from its entrance near the steep bare hill called Fourth Cliff, the only hill of slight prominence on the beach separating the river from the ocean. The river is of no importance, and is only used by vessels of extremely light draught whose masters are well acquainted with the locality, its mouth being nearly closed by dry flats. South River is a very small, narrow, and crooked stream making to the southward from just inside the entrance to North River. It is not navigable.

* Shown on charts 7, scale $\frac{1}{250,000}$, price \$0.50; 109 and 110, scale $\frac{1}{250,000}$, price of each \$0.50.

The shore is quite bold to along this stretch of coast, and 4 fathoms can be taken to within $\frac{1}{2}$ mile (and much closer in places) of the shore line, but between Green Harbor Point and Gurnet Point there are three outlying ledges (see dangers under section 1, sailing directions, Plymouth Harbor).

CAPE COD BAY,*

is a large, nearly circular bay contained between the peninsula of Cape Cod on the east and south and the mainland of Massachusetts on the west. Between these limits it is about 20 miles in diameter with deep water (the soundings varying from 10 to 27 fathoms except close to the shore) and is almost entirely unobstructed. Its eastern point at entrance is called **Race Point** (the northwestern extremity of Cape Cod) and its western point at entrance is called **Gurnet Point**. From Race Point to Gurnet Point the distance is $16\frac{1}{2}$ miles and the bearing W. Within the limits of Cape Cod Bay are embraced several important harbors—those of Plymouth and Duxbury on the western shore, Barnstable and Yarmouth on the southern, and Wellfleet and Provincetown on the eastern shore, all of which are treated of under special headings.

Cape Cod is a long peninsula, forming the eastern extremity of Massachusetts. It makes out from the mainland, first in an easterly direction for 31 miles, and then nearly due N. for a little over 20 miles—this latter portion forming what is usually termed the Hook of the Cape. It is composed almost entirely of sandy lands, diversified with high, bare sand hills, and low, nearly level, plains well cultivated and thickly settled. On its northern side is Cape Cod Bay, on its southern Nantucket and Vineyard sounds, into and through which passes nearly all of the coasting trade of the New England States, and on its back or western side is Buzzards Bay.

A Table of Lighthouses will be found on page 10, which gives the characteristics of the coast and harbor lights and their geographical positions.

Lists of the Life-Saving Stations maintained between Cape Ann and Point Judith are given on pages 20-21.

Extracts from the laws of Massachusetts relating to Pilots and Pilotage, Harbor Control, and Quarantine are given in Appendix I.

Ice, and its effects in Cape Cod Bay. As a rule this bay is unsafe during the winter, owing to the great quantities of drift-ice which, being driven out of the rivers and harbors of Massachusetts Bay, masses into heavy floes and drives down upon the southern and eastern shores of Cape Cod Bay. During very severe winters the ice "packs," and in some cases (as in 1875) extends as far from the southern shore as a line from Wood End to Sandwich, thus closing Barnstable, Wellfleet, and Provincetown harbors, and attains the extraordinary thickness of 18 feet. This impassable barrier remains until the return of spring, and navigation of all kinds is of course suspended. In these extreme cases, which are fortunately rare, vessels caught in the floes have been known to drift helplessly about with the pack until released by the warmer weather and consequent breaking up of the ice at the commencement of spring.

The prevailing NW. winds are the cause of the presence of most of the "drift" and "pack" ice, as they bring it from Boston and other harbors W. of Cape Ann, and there being no outlet to Cape Cod Bay, the ice masses together and increases in thickness and extent. Northeasterly winds, on the contrary, tend to break up the pack, while those from E. to SW. prevent formations and remove any that may have taken place.

The tidal current, so far as ascertained, seems to have little or no effect upon the movements of the ice.

PLYMOUTH HARBOR,†

the most northern and western harbor in Cape Cod Bay, affords excellent and safe anchorage, and is composed of three different harbors—Duxbury Bay, Kingston Bay, and Plymouth Harbor proper. The common entrance is just to the southward of Gurnet Point, and is S. by E. 17 miles from Minots Ledge Lighthouse and $16\frac{1}{2}$ miles W. from Race Point Lighthouse.

Duxbury Bay is contained between Duxbury Beach on the east, Saquish Neck on the south, and the mainland on the west. It is of irregular shape, and about 3 miles long, with an average width of 2 miles; but is almost all occupied by flats, dry at low water, and intersected by various narrow channels, which are not navigable without a pilot. In the lower part of the bay there is deep water (from 3 to 6 fathoms) with good anchorage in what is called the **Cowyard**. A narrow channel, through which 8 feet may be taken, leads up to Duxbury, but the wharf line of the village is all dry at low water. Another channel leads along the western shore of Clark Island, and thence gradually approaches Duxbury Beach, which it skirts for some distance, and enters a narrow and shoal stream called **Back River**. About 7 feet at low water may be taken up to **Powder Point** (the western point at entrance to this river), but not more than 4 feet above that point. The channel is narrow and intricate and is not fit for strangers.

* Shown on charts scale 7, $\frac{1}{400,000}$, price \$0.50; 110, scale $\frac{1}{80,000}$, price \$0.50.

† Shown on charts 235, scale $\frac{1}{40,000}$, price \$0.25; 110, scale $\frac{1}{80,000}$, price \$0.50. See also footnote on page 9.

Kingston Bay, contained between the mainland and the western point of Duxbury Bay, has a diameter of about $1\frac{1}{2}$ miles, but is so full of flats as to render its navigation entirely unsafe, even with a pilot, except at high water. The village of **Kingston** is built upon its western shore (about $\frac{1}{2}$ mile back from the water) on a small stream called **Jones River**. The bay is of little importance as a harbor or port.

Several channels lead between the flats of this bay, but they are narrow and crooked. The northernmost and deepest, **Miles or South Channel**, to Duxbury, is partly buoyed and by it about 8 feet at low water can be taken to the wharf on the western side of the peninsula between Duxbury and Kingston Bay.

Plymouth Inner Harbor is about 1 mile wide at its northern end, gradually narrow for $2\frac{1}{2}$ miles to its southern end. It is almost all dry at low water and is unfit for navigation, except for steamers, or at high water for vessels having pilots.

The channel, which is very narrow, runs first to the southward along the western side of Long Beach for nearly 1 mile, then turns abruptly at right angles, running to the westward towards the town of Plymouth for about $\frac{1}{2}$ mile, and then to the southeastward towards the head of the harbor for about the same distance.

In front of the city wharves a basin 800 feet long and 150 feet wide and 9 feet deep has been dredged, which is connected with deeper water by a dredged channel. In June, 1890, the improved channel was 115 feet wide and 9 feet deep at mean low water, extending from the main channel outside through the north side of the basin and to the wharves at Plymouth. It is proposed to make this channel 130 feet wide and to enlarge the basin. There are none but local guides through the dredged channel.

Gurnet Point, on the southern end of Duxbury Beach and E. of **Saquish Neck**, is about 80 feet in height, bare of trees, and marks the northern side of the entrance to Plymouth Harbor. On this point is **Gurnet Lighthouse and beacon** (see table, page 10).

Captains Hill, on the peninsula between Duxbury and Kingston bays, is about 200 feet high and on its top is **Standish Monument** which shows prominently from all directions in approaching the harbor. **Manomet Hill**, about 5 miles to the southward of Gurnet Point, is over 380 feet in height, heavily wooded, and is a conspicuous landmark in approaching the entrance.

Channel.—The channel leads from the deep water to the southward of Gurnet Point in a westerly direction to the Cowyard, and is over $\frac{1}{2}$ mile wide until to the southward of Saquish Head where it is only about 300 yards wide between the 18-foot curves. The aids in entering are described in connection with the sailing directions.

The deepest draught of vessels going to Plymouth is about 13 feet, which must be taken near high water. The deepest draught of those entering the Cowyard is about 13 feet; of those going to Duxbury 8 feet; into Kingston bay 8 feet. About 7 feet at mean low water can be found at the four principal wharves of Plymouth.

Anchorage.—The best anchorage is in the Cowyard, but light draught vessels often find good anchorage under the lee of **Long Beach**, just to the southward of Pier Head beacon, in 3 to 4 fathoms of water.

Pilots.—There are regular pilots and one can be had by making signal when off Gurnet Point.

Towboats may be had by telegraphing to Boston and are sometimes used, if going beyond the Cowyard.

There are no special harbor regulations and no harbor dues.

Supplies.—General supplies can be had from Boston by rail. Anthracite coal, water, and cordage can be obtained at either of the three wharves at Plymouth; in case of necessity bituminous coal can be obtained from either of two factories.

Tides, see page 22.

The **tidal current** is strong, the greatest strength being between the Gurnet and Duxbury Pier and at the entrance to the Cowyard. The set is generally in the direction of the channel; but the ebb sets to the southward and eastward across Browns Bank, while the flood sets to the northward and westward above Saquish Head and sweeps strong around Duxbury Pier into the Cowyard to the northward.

Ice.—This harbor is usually obstructed every winter for a few weeks by local ice, and in January and February large masses of drift ice may be encountered, which renders the approaches hazardous and makes the Outer Harbor unsafe as an anchorage. In severe winters the harbor is closed to all navigation from December to March. Westerly winds have a tendency to carry the ice out in fields (see ice, Cape Cod Bay, page 57).

SAILING DIRECTIONS, PLYMOUTH HARBOR.

These directions lead to an anchorage in the Cowyard and carry a least depth of about 21 feet.

In approaching, Gurnet Lighthouse may be steered for on any bearing between S. by W. $\frac{1}{2}$ W. through W. to NW. until within $\frac{1}{2}$ mile of them. Bearings and distances from other lighthouses to this are given on page 18 and will be of assistance in shaping the course for it.

1. Approaching from the Northward.—When to the eastward or southeastward of Minots Ledge Lighthouse, stand to the southward giving the shore a berth of at least $1\frac{1}{2}$ miles until Gurnet Lighthouse is made. When this lighthouse is made keep it bearing to the westward

of **S.** by **W.** $\frac{1}{2}$ **W.** and steer so as to pass about $\frac{1}{2}$ mile to the eastward of it. When the whistling buoy at the entrance is made, steer so as to pass it close-to on either side, and from it **W.** by **S.** and follow the directions in section 2.

Remarks.—The appearance of the shore line to the northward of Plymouth Harbor is described on pages 56–57. Gurnet point is described on page 58, and Gurnet Lighthouse, on it, on page 10.

Dangers.—**Howland Ledge** has 7 feet of water over it and lies $1\frac{1}{2}$ miles from the nearest shore and $4\frac{1}{2}$ miles **N. $\frac{1}{2}$ E.** from Gurnet Lighthouse. It is marked off its eastern side by a buoy (red, No. 4). Strangers should not attempt to pass inshore of Howland Ledge.

Bartlett Rock is a small rock bare at low water, but has depths around it ranging from 7 to 18 feet; it lies about $\frac{1}{2}$ mile to the westward of Howland Ledge and is marked by a buoy (red, No. 2) placed just to the eastward of the bare rock.

High Pine Ledge has a least depth of 2 feet and shows bare at low water of spring tides; it lies 2 miles **N. $\frac{1}{2}$ E.** from Gurnet Lighthouses and is marked at its eastern end by a buoy (red, No. 6). The ledge extends to the westward of the buoy nearly to the shore and vessels should not attempt to pass between it and the shore.

Gurnet Rock is a detached ledge near the end of the shoals making 600 yards to the southeastward from Gurnet Point; it has 4 feet over it and is marked by a buoy (red, No. 2), which should be left on the starboard hand by vessels entering.

1 A. Approaching from the Southward.—Give the shore a berth of at least 1 mile, although it may be approached closer in places. Keep Gurnet Lighthouse bearing to the westward of **NW.** and steer for it, and when up to the buoys at the entrance proceed as directed in section 2, following:

Remarks.—**Manomet Point** is a little over 5 miles **S.** by **E. $\frac{1}{2}$ E.** from Gurnet Point, and **Rocky Point** is a little less than $2\frac{1}{2}$ miles to the northwestward of Manomet Point. A little to the southward of Rocky Point a high hill (Manomet Hill, see description, page 60) will show prominently and be seen before either of the points can be distinguished.

When to the northward of Rocky Point the town of Plymouth will be seen over Long Beach and the entrance buoys near Gurnet Point should be seen.

Dangers.—**Stellwagen Rock**, a small detached rock with 6 feet over it, lies about $\frac{1}{2}$ mile from the shore and $1\frac{1}{2}$ miles **S.** by **E. $\frac{1}{2}$ E.** from Manomet Point.

Mary Ann Rocks are two detached rocks, bare at low water, the easternmost lying $\frac{1}{2}$ mile **SE. $\frac{1}{2}$ E.** from the northeastern end of Manomet Point. The inner rock lies about 300 yards **NW.** from the easternmost.

Stone Horse Rocks are bare at low water and lie between Mary Ann Rocks and the southeastern extremity of Manomet Point.

There are several outlying rocks between Manomet Point and Rocky Point, the point about $2\frac{1}{2}$ miles to the northwestward, but these are avoided by giving the shore a berth of at least $\frac{1}{2}$ mile, and the sailing line passes well to the eastward of them.

Gurnet Lighthouse and beacon in range clears the dangers in approaching from the southeastward.

2. Entering and to an Anchorage in the Cowyard.—Having followed the directions in sections 1 or 1A until up to the whistling buoy, pass it close-to and steer **W.** by **S.** for about $2\frac{1}{2}$ miles, keeping Pier Head beacon ahead and a little open to the northward of Browns Bank (west) buoy (black, No. 5). When up to this buoy leave it about 100 yards on the port hand and steer **W.** by **N.** so as to pass about 200 yards to the southward of Duxbury Pier Lighthouse and about midway between it and black buoy No. 7. When the lighthouse bears **N.**, haul gradually to the northward and round it and Duxbury beacon, giving them a berth of at least 100 yards. Anchor anywhere to the westward of the lighthouse but not more than 600 nor less than 100 yards from it.

Or, turn to the northward, rounding the lighthouse at a distance of about 150 yards, and steer about **N.** by **W.** for black buoy No. 9, on Captain Flat. When just past Duxbury beacon (day beacon) haul a little more to the northward and anchor under the lee of Muscle Bank in from 5 to 8 fathoms.

Or, continue the **N.** by **W.** course until the red buoy (No. 4) marking the western side of the Muscle Bank will be left on the starboard hand on a **N NE. $\frac{1}{2}$ E.** course, and then steer that course, passing between this red buoy and black buoy No. 9, and anchoring in the Cowyard a short distance to the northeastward of black buoy No. 9, marking the southeastern end of Captain Flat.

The **N NE. $\frac{1}{2}$ E.** course leads up through the Cowyard, but on both sides of the channel, flats rise abruptly with from 3 to 12 feet of water over them near their edge.

If bound to Duxbury, a pilot must be taken; it is not safe to attempt to go beyond the Cowyard without one.

Kingston Bay.—There is a channel into Kingston Bay as far as the wharf at Captain Hill. No sailing directions can be given for this channel, however. Strangers should always take a pilot.

PLYMOUTH HARBOR—SAILING DIRECTIONS.

If bound to Plymouth Inner Harbor.—Small vessels may round black buoy No. 7, on Dicks Flats, passing to the northward of it, and steer SW. $\frac{1}{2}$ S. for $\frac{1}{2}$ mile, carrying not less than 12 feet water in the channel, until Pier Head beacon bears E NE. $\frac{1}{2}$ E., about 200 yards distant. Here anchor and take a pilot.

Remarks.—Anchorage is found along the western side of Long Beach just below the Breakwater beacon; but this anchorage is not recommended for strangers. There are no buoys to mark the dredged channel which connects the inner anchorage with the dredged basin off the wharves of Plymouth. Strangers should take a pilot.

On the W. by S. course, Bass Rock buoy (red, No. 2) will be left about 300 yards on the starboard hand and black buoys (Nos. 1, 3, and 5) on the port hand. Pier Head beacon (granite pyramid, with staff on top surmounted with a cage) is at the northern extremity of Long Beach, and Duxbury beacon (square granite, surmounted by granite post 4 feet high) is about 100 yards to the northwestward of Duxbury Pier Lighthouse. (See table, page 10.)

Dangers.—Bass Rock has 4 feet over it and lies about 500 yards S. $\frac{1}{2}$ W. from the lighthouses; it is marked by a buoy (red, No. 4).

Browns Bank is the extensive shoal, showing bare in places at low water, which extends to the eastward $2\frac{1}{2}$ miles from Pier Head and forms the southern side of the channel to the westward of Gurnet Point. The northern edge of this shoal rises abruptly from the deep water of the channel and is marked by several buoys. East end of Browns Bank buoy (black, No. 1) marks the eastern end of the shoal and lies about $\frac{3}{4}$ mile S SE. $\frac{1}{2}$ E. from Gurnet Lighthouse. Browns Bank buoy (black, No. 3) is on the edge of the shoal about $\frac{1}{2}$ mile to the westward of black buoy No. 1. West Browns Bank buoy (black, No. 5) is on the edge of the shoal nearly $\frac{1}{2}$ mile to the eastward of Duxbury Pier Lighthouse.

Saquish Point Shoal makes to the southward nearly $\frac{1}{2}$ mile from the point about $1\frac{1}{2}$ miles to the westward of Gurnet Point. Saquish Head Rock, a detached rock with 6 feet of water over it, lies about 350 yards to the southward of Saquish Head, the bluff, sandy head on Saquish Point. The bight between Saquish Head and Gurnet Point is full of shoals.

Dicks Flats, showing bare at low water, lie to the northward of Pier Head and join the western end of Browns Bank. The channel into Plymouth Harbor leads along the western edge of these flats. A buoy (black, No. 7) is placed on the northern point of the shoal.

Muscle Bank is the extensive shoal making to the southwestward from Clark Island, and is marked at its southern end by Duxbury Pier Lighthouse (see table, page 10). On the western edge of the bank to the northwestward of the light are Duxbury beacon (square, granite structure, surmounted by a granite post) and a buoy (red, No. 6).

Captain Flat is the large shoal lying on the western side of the Cowyard and extending to Duxbury Point. Along the edge of the channel the depths on the flat range from 4 to 11 feet, but the greater part of it, lying nearest the shore, is dry at low water. The southeastern point is marked by a buoy (black, No. 9), which marks the western side of the entrance to the Cowyard. The southern edge of the flat is marked by 3 red buoys, which are the guides to the channel to Captain Hill wharf.

COAST FROM PLYMOUTH TO BARNSTABLE.*

Nearly $3\frac{1}{2}$ miles S. from Gurnet Point is Rocky Point. Between these two points a deep indentation makes into the shore, to which is often given the name of **Plymouth Bay**. This bay is separated from Plymouth Harbor by Long Beach which runs S. by E. $\frac{1}{2}$ E. for $2\frac{1}{2}$ miles from Pier Head, its northern point. At its southern end the shore turns abruptly to the eastward for 2 miles to Rocky Point, thus forming a large cove—**Warren Cove**; this cove affords anchorage in southerly winds in 3 to 5 fathoms, sandy bottom.

From Rocky Point the general course of the shore is SE. for nearly $2\frac{1}{2}$ miles to Manomet Point. The shore between these two points varies in height and character, showing in some places steep wooded hills and in others low lands, sandy or grassy, and in many places cultivated, but all backed by high wooded hills, the most conspicuous of which are the **Manomet Hills**. Manomet Point, almost entirely bare of trees, shows an undulating surface with several houses upon it.

From Manomet Point the general trend of the shore is S. for 4 miles to Center Hill Point. The shore between these two points is all thickly wooded and of moderate height, except at **Indian Hill**, $2\frac{1}{2}$ miles below Manomet Point. This hill is high, thickly wooded, and shows precipitous faces to seaward. Center Hill Point is a low point, cleared near its eastern extremity, but backed by higher lands thickly wooded.

From Center Hill Point the shore line has a direction SW. by S. for $1\frac{1}{2}$ miles, then turns to the westward for $\frac{1}{2}$ mile and then sweeps with a regular curve from SW. to SE. by S. around to the entrance of Sandwich, $6\frac{1}{2}$ miles below. The shore is for the most part thickly wooded, and faced by a sand beach called **Scusset Beach** to abreast of West Sandwich, about 5 miles below Center Hill Point. From here to the entrance of Sandwich Harbor the shore is low and composed of marsh lands faced by a sand beach known by the name of **Town Beach**. Back of the beach are higher lands, partly wooded and partly cleared and settled.

The entrance to the harbor of Sandwich is extremely narrow, passing between two stone piers or breakwaters; it can only be entered at high water, and then a pilot is necessary. Pilots may always be obtained off the bar at the entrance of the harbor. The village of Sandwich is to the westward of the harbor, $\frac{1}{2}$ mile back from the beach.

* See footnote on page 57.

From Sandwich Harbor entrance Spring Hill Beach extends in a SE. direction for $2\frac{1}{2}$ miles; it is backed by low lands cultivated and settled. Thence the trend is ESE. for 6 miles to Barnstable entrance, and the shore is for the most part composed of sand hillocks backed by marsh lands. The highest part of this shore with some houses and trees upon it, and lying just to the eastward of Spring Hill Beach, is known as Scorton Neck. From here Sandy Neck, composed entirely of sand and dotted with occasional clumps of trees, extends to Barnstable entrance. At its eastern end it turns more to the southward and terminates in Beach Point, on which Sandy Neck Lighthouse stands.

The coast from Rocky Point to $1\frac{1}{2}$ miles south of Center Hill Point should be given a berth of 1 mile, as there are a number of outlying rocks and ledges. When beyond this limit the shore is generally bold-to and can be approached to within $\frac{3}{8}$ mile until 2 miles to the westward of the entrance to Barnstable Harbor (see sailing directions for this harbor).

BARNSTABLE HARBOR.*

This harbor lies on the southern shore of Cape Cod Bay; the entrance, about 38 miles SSE. from Minot Ledge Lighthouse, is obstructed by a bar with only 7 feet of water over it at low water, and is marked by Sandy Neck Lighthouse (see table, page 10), which is on the western point. The harbor is formed by an arm of the bay extending in a general E. and W. direction about 3 miles between Sandy Neck and the main shore; flats and shoals occupy nearly the whole harbor, leaving only narrow channels, which are difficult for a stranger to follow. Vessels entering usually await a favorable stage of the tide to cross the bar. Few vessels enter the harbor, the greatest draught being 12 feet. Strangers should make signal and remain well outside the bar until a pilot comes out. Towboats are seldom used.

The towns of Barnstable, Yarmouth Port, and Yarmouth are on the southern shore of the harbor, the two latter being of no commercial importance. The approach to Yarmouth Port is by a narrow, shallow slue making through the flats which are bare at low water and lie on the eastern side of Barnstable Harbor proper.

Ice obstructs the harbor greatly during the winter. Note the remarks on page 57.

Tides.—See page 22.

The tidal currents generally set fair with the direction of the channel.

For variation of the compass see page 22.

GENERAL DIRECTIONS, BARNSTABLE HARBOR.

The following directions lead to the entrance, where a pilot should be taken.

From a position about $1\frac{1}{2}$ miles to the eastward of Minot's Ledge Lighthouse, steer S. by E. $\frac{1}{4}$ E. about $36\frac{1}{2}$ miles.

Or, from a position to the westward of Race Point Lighthouse, steer S. by W. $\frac{1}{4}$ W. about $17\frac{1}{2}$ miles.

Make the signal for a pilot and stand off and on, or anchor in about 6 fathoms water with Sandy Neck Lighthouse bearing about SSW. $\frac{1}{2}$ W.

Remarks.—Sandy Neck Lighthouse should be made on the starboard bow. The entrance is full of flats and shoals which extend 2 miles from the shore to the eastward of the lighthouse, and vessels should not shoal the water to less than 6 fathoms. In strong northerly winds a heavy sea makes on the bar and vessels bound to Barnstable should anchor in Plymouth or Provincetown until the weather moderates.

COAST FROM BARNSTABLE TO WELFLEET.

From the entrance to Barnstable Harbor the shore line has a general direction of about E. $\frac{1}{4}$ N. for 9 miles, when it curves sharply to the northward and has a general direction of N. $\frac{1}{4}$ E. for about 6 miles to Welfleet Harbor. The shore line is broken in a few places by small creeks, none of which are of importance; and there are several small villages a little back from the beach, plainly visible from offshore.

The coast is comparatively low, somewhat undulating, for the most part cleared and thickly settled, and backed by thickly wooded hills. The shore may be approached a little to the eastward of Barnstable entrance in $3\frac{1}{2}$ fathoms to within $\frac{1}{2}$ mile, but farther to the eastward the 18-foot curve is from $\frac{1}{2}$ to $1\frac{1}{2}$ miles from the shore.

WELFLEET HARBOR †

is situated on the western side of the hook of Cape Cod, near its southern end, and about 11 miles to the southward of Provincetown Harbor. Extensive shoals lie in the entrance and extend about $5\frac{1}{2}$ miles to the westward from

* Shown on charts 339, scale $\frac{1}{20,000}$, price \$0.20; 110, scale $\frac{1}{80,000}$, price \$0.50.

† Shown on charts 340, scale $\frac{1}{20,000}$, price \$0.20; 110, scale $\frac{1}{80,000}$, price \$0.50.

WELLFLEET HARBOR—SAILING DIRECTIONS.

Billingsgate Island Lighthouse (see page 10), which marks the western side of the entrance to the harbor. **Mayo Beach Lighthouse** is at the head of the harbor and is the guide to the anchorage in the inner harbor. The channel into the harbor leads between the shoals and is comparatively narrow, but is marked by buoys so as to be easily followed in the daytime in clear weather; it has a least depth of 14 feet until above Smalley Bar.

The town of **Wellfleet** is at the head of the harbor, but can only be reached by vessels at high water. It is proposed to dredge a channel 4,200 feet long, 100 feet wide, and 6 feet deep from the 6-foot curve in the inner harbor to the wharves of the town. The dredged channel in 1891 was 4 feet deep and 25 feet wide up to the wharves. Wellfleet has railroad communication with Provincetown and Boston, and a line of steamers to Boston during the summer.

Strangers intending to enter Wellfleet Harbor generally take a pilot, and should always do so. It is usual to go into Provincetown Harbor first and telegraph to Wellfleet for a pilot, who then joins the vessel at Provincetown. In going directly to Wellfleet entrance, if signal is made when off Billingsgate Island, a pilot will come out from the town, the vessel anchoring meanwhile, if desirable, in the channel off the shoal grounds.

The greatest draught of vessels entering Wellfleet Harbor is about 12 feet; the usual draught averages about 10 feet. Vessels do not enter this harbor in winter. Towboats are not much used in these waters.

Anchorage.—The best anchorage is in the inner harbor, where the depth ranges from 10 to 15 feet. The anchorage in the outer harbor is somewhat exposed in westerly winds; the depth ranges from 14 to 31 feet between Billingsgate Island and Smalley Bar, and from 14 to 18 feet between Stony Bar and Billingsgate Island. In strong northerly gales vessels that have fallen to leeward of Provincetown sometimes anchor to the leeward of Billingsgate Shoal in 3 to 8 fathoms water, the shoal breaking the sea so that vessels with good ground tackle can ride out a heavy gale from the northward.

Supplies.—Ship chandler's stores, provisions, fresh water, and anthracite coal in limited quantities can be obtained at Wellfleet.

There are no special harbor regulations and no harbor dues.

Tides.—The mean rise and fall of tides is 10.7 feet. Corrected establishment 11^h 20^m.

The tidal currents are weak.

SAILING DIRECTIONS, WELLFLEET HARBOR.

The directions in sections 1 and 2 are good for vessels of less than 10 feet draught, in daylight, with a favorable wind and clear weather and lead to an anchorage in 14 to 19 feet of water just to the northward of Smalley Bar buoy. Strangers of over 10 feet draught should take a pilot, coming to anchor south of Billingsgate Shoal until boarded by one. The directions in section 1 A are for vessels of over 10 feet draught, or those that, having fallen to leeward of Provincetown, desire to anchor under the lee of Billingsgate Shoal.

1. Approaching and Entering.—From off Race Point Lighthouse steer **S. $\frac{1}{4}$ E.** nearly 14 miles; or, from the whistling buoy off Plymouth entrance, steer **SE. $\frac{1}{4}$ E.** about 21 $\frac{1}{2}$ miles; or, from a position 1 $\frac{1}{2}$ miles to the eastward of Minots Ledge Lighthouse steer **S SE. $\frac{3}{4}$ E.** nearly 37 miles. Billingsgate Island Lighthouse should then bear **E NE.** distant about 5 $\frac{1}{2}$ miles, and the black spar buoy marking the end of Billingsgate Shoal should be close aboard. Pass south of this buoy and steer **E. $\frac{1}{2}$ S.** about 4 miles until Billingsgate Island Lighthouse bears **N NE.**, then steer **NE. $\frac{1}{2}$ E.** so as to pass close to the southward of black buoy No. 3. Leave this buoy about 50 yards on the port hand and follow the directions in section 2.

Remarks.—Vessels finding themselves too far to the westward to see the buoy on the end of Billingsgate Shoal, should bring Billingsgate Island Lighthouse to bear **E NE.** and steer for it on this bearing until up to the buoy. On the **E. $\frac{1}{2}$ S.** course when Billingsgate Island Lighthouse bears **N NE.** Bibb Rock buoy should be 1 $\frac{1}{2}$ miles distant ahead and the course should then be changed to **NE. $\frac{1}{4}$ E.** for Billingsgate Flat buoy, which should be made a little on the port bow.

Dangers.—Billingsgate Shoal commences about 4 $\frac{1}{2}$ miles to the northward of Billingsgate Island Lighthouse and extends 8 $\frac{1}{2}$ miles in a general **SW. $\frac{1}{4}$ S.** direction from the shore of Cape Cod and about 5 $\frac{1}{2}$ miles in a general **W SW.** direction from the lighthouse. It is marked at its western end by a buoy (black, No. 1). The water shoals gradually on the northern side of the shoal, but along its southern side the shoaling is very abrupt.

Bibb Rock, a detached rock with 8 feet over it, lies 2 $\frac{1}{2}$ miles **S. $\frac{1}{4}$ E.** from Billingsgate Island Lighthouse; it is marked by a buoy (red and black horizontal stripes).

Billingsgate Flat has 3 to 9 feet of water over it and extends about 1 $\frac{1}{2}$ miles to the southward from Billingsgate Island; it is marked at its southeastern point by a buoy (black, No. 3).

1 A. *Approaching and to an Anchorage to the Southward of Billingsgate Shoal.*—Follow the directions in section 1, until Billingsgate Island Lighthouse bears **E NE.**, taking care to pass to the westward of Billingsgate Shoal buoy.

When a short distance to the southward of the buoy, steer **E.** by **N.**, and when the water shoals to 4 fathoms anchor with Billingsgate Island Lighthouse bearing about **NE. $\frac{1}{2}$ E.**

At night.—To avoid the end of Billingsgate Shoal, keep Wood End Light bearing a little to the eastward of **N. $\frac{1}{8}$ E.** until Billingsgate Island Light bears to the northward of **E NE.** Then steer for Billingsgate Island Light and anchor when the water shoals to 4 fathoms with the light bearing about **NE. $\frac{1}{2}$ E.**

Remarks.—A stranger approaching Wellfleet from the northward and being uncertain of his distance to the westward of Billingsgate Island can tell when the shoals are cleared by using the lead. The waters shoals gradually on the north side of Billingsgate Shoal, and when the depth is about $4\frac{1}{2}$ fathoms it is advisable to stand to the westward until the buoy on the end of the shoal is made. *At night* the lights on Race Point, Wood End, Long Point, Sandy Neck, and Billingsgate Island may all be seen at one time. If on a line between Sandy Neck and Billingsgate Island lights, a course for the latter passes about $\frac{1}{2}$ mile to the southward of Billingsgate Shoal buoy. In approaching the light care should be taken to avoid the southern edge of the shoal, which rises abruptly from deep water.

For dangers see section 1, preceding.

2. *From Billingsgate Flat Buoy to the Anchorage above Smalley Bar.*—Leaving Billingsgate Flat buoy about 50 yards on the port hand, steer **N.** by **E.** about $\frac{3}{4}$ mile, then change course to about **NW. $\frac{1}{2}$ N.**, keeping red buoy No. 2 a little on the starboard bow. Leave this buoy about 25 yards on the starboard hand and steer about **N.**, so as to leave red buoy No. 4 about 30 yards on the starboard hand. When this buoy is abeam steer about **NE.** nearly $1\frac{1}{2}$ miles; leave black buoy No. 5 about 30 yards on the port hand and steer about **N. $\frac{1}{2}$ E.** Anchor in 16 to 20 feet of water, about $\frac{1}{4}$ mile to the northward of this buoy, and if bound to the wharves await high water and a pilot.

Remarks.—The **N.** by **E.** course will clear the eastern edge of Billingsgate Flats. When the course is changed to **NW. $\frac{1}{2}$ N.** two red spar buoys should be on the starboard bow. The channel leads to the westward of these buoys and is very narrow; on the ebb tide the current has a tendency to set a vessel to the southeastward. On the **NE.** course black buoy No. 1 should be made and kept a little on the port bow. After this buoy is passed a stranger should not go farther towards the head of the harbor without a pilot.

Dangers.—Lieutenant Island Bar extends from the eastern shore towards Billingsgate Island, leaving a channel 100 yards wide with a least depth of 14 feet between its western end and the shoals that make to the eastward from Billingsgate Island. The eastern edge of this channel is marked by two buoys (red, Nos. 2 and 4).

Smalley Bar makes to the eastward from the west shore about $1\frac{1}{2}$ miles to the northward of Billingsgate Island. It is marked at its eastern end by a buoy (black, No. 5), to the eastward of which the channel is about 200 yards wide.

A large area of the flats which extend from the eastern shore towards the channel is uncovered at low water.

PROVINCETOWN HARBOR. *

is formed by a turn in the northern end of the Hook of Cape Cod, and has a diameter of about 2 miles. Its entrance is about 11 miles above Billingsgate Island Lighthouse and lies between the western shore of the Hook and Long Point, the southeastern extremity of the point of the Hook. This harbor is one of the best on the Atlantic coast, being of sufficient capacity for large fleets and having anchorage in from 3 to 10 fathoms with excellent holding ground. Hundreds of coasters and fishermen find shelter here during northerly gales. The approach and entrance are free from danger and are marked by three lighthouses: **Race Point Lighthouse**, on the northwestern point of Cape Cod; **Wood End Lighthouse**, on the southern end of the Hook, where it turns to the eastward; and **Long Point Lighthouse**, on the western point at the entrance to the harbor. At night Cape Cod Lighthouse will show over the land to the westward of it when approaching the entrance on certain bearings. (See the table of lights on pages 10–12, for description of these lighthouses). **Herring Cove**, about $\frac{1}{2}$ mile to the southward of Race Point Lighthouse, is sometimes used for shelter from northeasterly and easterly winds; small vessels anchor well inshore in from 10 feet to 4 fathoms, according to draught.

Provincetown occupies the northwestern shore of the harbor, being situated at the base and on the slopes of the high steep hills which form this shore. It is the home port of many vessels engaged mainly in the cod, mackerel, and whale fisheries, and to a limited extent in the coasting and foreign trade. Such portion of the carrying trade of the port as is done by strangers is confined mostly to the transportation of coal, salt, lumber, and wood.

Prominent objects.—In making the northern part of Cape Cod in clear weather, the first objects seen are several high church spires of Provincetown. It is frequently difficult to recognize natural landmarks on Cape Cod when

* Shown on charts 541, scale $\frac{1}{50,000}$, price, \$0.20; 110, scale $\frac{1}{80,000}$, price, \$0.50. See also footnote on page 9.

approaching from seaward owing to a lack of distinctive features. The life-saving stations (see pages 20-21) and the lighthouses are about the only well-defined marks; of the latter, Cape Cod Lighthouse is the most important, being the chief guide for this part of the coast.

The depth of water at the entrance and in Provincetown Harbor is ample for vessels of deep draught. There are practically no dangers, if the shores be given a berth.

There are a number of wharves, but their use is confined to vessels of less than 13 feet draught. The principal ones are the steamboat wharf and the one belonging to the Old Colony Railroad. At mean low water the depth at the outer ends of these two is 8 feet for the former and 7 feet for the latter. All the other wharves are dry at low water.

Pilots are not necessary and are very rarely taken by strangers in entering. Extracts from the pilotage laws of the State are given in Appendix I.

Towboats are not much used. A small steamer owned at the port is sometimes used for towing. During the stormy season towboats from Boston are generally to be found here; by telegraphing one can be called from there in 6 hours.

There are no special harbor regulations. The custom-house is near the head of the steamboat wharf.

The U. S. Marine Hospital at Chelsea, Mass., is the one to which mariners entitled to hospital treatment are sent from Provincetown. Under the Marine Hospital Service and subject to the usual regulations (see Appendix III), mariners entitled to treatment receive relief at third-class stations.

Supplies, provisions, and ship chandler's stores can always be obtained. Coal can not, as a rule, be had for steamers; only a limited quantity is kept on hand. Fresh water is furnished by a water boat; it can also be obtained at the steamboat wharf, or at the railroad wharf, pipes leading to the ends of these wharves.

The wind signals of the U. S. Weather Bureau are displayed at Provincetown from High Pole Hill or Town Hill. The signals hoist 130 feet above the sea and are visible from all directions in approaching the coast. An explanation of the use and meaning of these signals is given in Appendix II, and a list of stations is given on page 20.

Communication.—Boats run daily during the summer, and make two or three trips a week during the rest of the year, to Boston, with which place Provincetown has railroad communication.

Ice.—This harbor is closed by ice only in extremely severe winters. In the winter of 1856-'57 the ice filled the harbor for two or three days, and in 1875 the blockade lasted from February 8, until March 1. In this latter year the pack, which extended across Cape Cod Bay, was forced across the harbor entrance, and thus favored the formation of local ice inside, so that in two days the whole harbor was sealed up, and so continued until the pack at the entrance broke up, when the harbor ice quickly followed out. As a rule, when ice packs across the entrance to Provincetown Harbor it requires for its removal winds from NE. around by the northward to NW., unless, as stated above, the pack extends over the whole bay and is heavy enough to resist the sea caused by such winds. In such cases the pack must first be broken up along the southern shores of the bay by southerly or southeasterly winds; and then, if these be followed by strong northerly or northeasterly winds, the harbor will soon be cleared. Winds from S. to SW. have a tendency to force the drift ice from the bay into the harbor; but these winds are of rare occurrence during the winter months.

For tidal data see table, page 22.

Currents.—Off Race Point the tidal currents are strong; the flood sets to the southwestward and the ebb in the opposite direction. To the westward of the stretch of coast forming the western side of the harbor the currents are nearly as strong; here the flood sets in a southeasterly direction, the ebb sets northwesterly. At the entrance and in the harbor the tidal currents are weak. With spring tides, at half flood the current has somewhat greater strength at the entrance and then sets to the westward, inside Long Point, and towards the western side of the harbor.

SAILING DIRECTIONS, PROVINCETOWN HARBOR.

These directions are good for vessels of the largest size and deepest draught either in the daytime or at night. In thick weather the lead can not be depended on to give warning of too close an approach to the shore from the westward on account of the abrupt shoaling of the water from 20 fathoms to 3 fathoms.

1. *Approaching and Entering from the Eastward around Cape Cod.*—Passing Cape Cod Lighthouse steer to the northwestward, following the trend of the shore and giving it a berth of $1\frac{1}{2}$ miles. When Race Point Lighthouse bears to the southward of SW., steer so as to give the shore a berth of $\frac{3}{4}$ mile or more and round Race Point Lighthouse at this distance, and when it bears ENE. steer SSE. until Wood End Lighthouse is abeam. Now steer about E., giving the shore to the eastward of the lighthouse a berth of at least $\frac{1}{2}$ mile. Follow the trend of the shore, giving it a berth of $\frac{3}{4}$ mile while to the southward and southeastward of Long Point Lighthouse.

Round Long Point Lighthouse giving it a berth of at least $\frac{3}{4}$ mile, and when it bears W. steer about NW. $\frac{1}{2}$ W., and anchor according to draught with the lighthouse bearing to the eastward of S., but

do not approach the eastern or northeastern shores of the harbor nearer than $\frac{3}{4}$ mile on account of extensive flats which make out. Toward the northern shore the shoaling is gradual; toward the western shore it is abrupt from 8 to 2 fathoms.

At night.—With Cape Cod Light bearing **W.** distant from $1\frac{1}{2}$ to 2 miles, steer **NW. $\frac{1}{4}$ N.** for 6 miles. Then steer **WNW. $\frac{1}{2}$ W.** until Race Point Light bears to the southward of **SW.**, when the direction above should be followed.

Remarks.—See the remarks on currents in the general description preceding. The eastern shore of Cape Cod to the northward of Cape Cod Lighthouse should be given a berth of $1\frac{1}{2}$ miles to avoid Peaked Hill Bar.

When Race Point Lighthouse bears to the southward of **SW.** the shore may be approached as close as $\frac{1}{2}$ mile and in some places $\frac{1}{4}$ mile, but the former distance is the safe one. The shore between Race Point and Wood End Lighthouse should be given a berth of at least $\frac{1}{2}$ mile to avoid Shank Painter Bar. When standing in for the harbor, Cape Cod Light at night will be seen across the intervening land and will show brighter than the other lights.

Dangers.—**Peaked Hill Bar** commences about 3 miles to the northwestward of Cape Cod Lighthouse and extends along the shore $2\frac{1}{4}$ miles, its distance from the beach being about $\frac{1}{4}$ mile. The depth over this shoal ranges from 14 to 18 feet and in heavy weather it is marked by breakers. A whistling buoy (red, "P. H. B." in white letters) is placed about $1\frac{1}{4}$ miles from the shore and nearly $4\frac{1}{2}$ miles **NW.** by **N.** from Cape Cod Lighthouse, as a guide to keep vessels from approaching the bar too closely in thick weather.

Shank Painter Bar makes off $\frac{1}{2}$ mile from the shore about midway between Race Point and Wood End lighthouses. The bar rises abruptly from a depth of 20 fathoms and the depth near its edge is 11 to 15 feet. It is not marked, but fish stakes usually extend out on it some distance from the shore.

Long Point Bar makes out from Long Point, its eastern end being $\frac{1}{2}$ mile **E.** by **S.** from the lighthouse. The depth on its end is 7 to 16 feet.

1 A. *Approaching from the Northward or Westward.*—Stand for either Race Point Lighthouse or for Wood End Lighthouse on any course until within about 1 mile of either, then follow the directions given in section 1, preceding.

COAST OF CAPE COD FROM RACE POINT TO MONOMOY.*

At Race Point the shore curves to the northward and then to the eastward, running about **E. $\frac{1}{4}$ N.** when it again turns and takes a course about **SE. by E.**, thence to the Highlands the trend is about **SE.** and the total distance about 9 miles. All of the east coast from Race Point to the Highlands is composed of bare sand hillocks of various heights. On approaching the Highlands the sand hills begin to be covered with a brownish looking growth of grass and the land is higher. The pitch of the cape at this point shows a high sand bluff, with steep, almost perpendicular faces, on which stands Cape Cod Lighthouse. In coasting several life-saving stations are seen, and just to the northward of the lighthouse is the signal station. Vessels passing this station can communicate with Boston by using the international code of signals. At the Highlands the shore is quite steep-to and may be safely approached as close as 700 yards, but the water shoals somewhat abruptly and care must be taken not to go inside of 5 fathoms. About 3 miles to the northwestward of Cape Cod Lighthouse, and nearly $\frac{1}{2}$ mile off shore, is Peaked Hill Bar, described above.

From the Highlands to Nauset Beach Lighthouses, about 12 miles below, the shore has a general course **S. by E.**, is tolerably clean and without a break, being composed of steep, almost perpendicular, sand cliffs of various heights. The Nauset Beach Lighthouses will appear, when seen from the northward, as three low white towers upon the summit of a steep sand cliff. To the southward of the lighthouses the coast turns very gradually to the southward—running about **S. $\frac{1}{2}$ W.** to Chatham, $10\frac{1}{2}$ miles below. It gradually becomes lower, less steep, and undulating, slopes gently back from the beach, and is covered with a scanty growth of thin grass. A few houses appear at long intervals. About $3\frac{1}{2}$ miles below Nauset Beach Lighthouses is the entrance to Nauset Harbor. Hence to Chatham the coast shows first a low sandy shore covered with small hillocks and backed by higherlands. About $6\frac{1}{2}$ miles below Nauset Harbor entrance is the site of the former northeastern entrance to Chatham, now closed. A line of breakers in ordinary weather stretches across the entrance at low water, and a long bar makes out to the eastward for $\frac{1}{2}$ mile, which is known as Chatham Bar. Here begins Nauset Beach, which extends in a **SW. by S.** direction for $4\frac{1}{4}$ miles.

From Cape Cod Lighthouse to near Chatham entrance the coast is somewhat steep-to, not less than 3 fathoms being found at a distance of $\frac{1}{2}$ mile from the shore. Nauset Harbor entrance may be known by the thickly-clustered houses in Weeset and Tonset, which appear on the summit of **The Ridge**, a rising ground somewhat higher than the land to the northward. In passing along Nauset Beach the town of Chatham and the Chatham Lighthouses (see table, page 12) can be seen over it. A short distance to the southwestward of the southern end of Nauset

* Shown on charts 7, scale $\frac{1}{400,000}$, price \$0.50; 110 and 111, scale $\frac{1}{80,000}$, price of each \$0.50.

MONOMOY AND NANTUCKET SHOALS.

Beach, and nearly joined to it at low water, is a narrow spit called **Monomoy Island**, which extends to the southward $4\frac{1}{2}$ miles, and forms the northern side of the entrance to Nantucket Sound. It is low, barren and sandy, covered with innumerable sand hillocks, and lies about S SW. and N NE. Its eastern shore is foul, having many sand bars off it. Vessels sometimes anchor off this shore in from 4 to 6 fathoms, and wait for a fair tide to beat through the sounds. As a general rule it is best not to approach the shore nearer than 1 mile after passing Chatham Lighthouses. The southern end of Monomoy Island is called **Monomoy Point**, and nearly $1\frac{1}{2}$ miles above its southern extremity stands **Monomoy Point Lighthouse**, which marks the northern point at the entrance to Nantucket Sound. From this lighthouse **Great Point**, or **Nantucket Lighthouse**, bears S SW. westerly, distant $10\frac{1}{2}$ miles, and the light on **Bishop and Clerks Shoal** WNW. $\frac{1}{2}$ W., distant $11\frac{1}{2}$ miles.

The life-saving stations, with their location, will be found on pages 20-21.

Currents.—The currents are tidal along the eastern coast of Cape Cod, but flood and ebb are usually of unequal velocity and duration. The flood (northerly current) predominates at zero, or very low, declinations, and the ebb (southerly current) at very high declinations of the moon. The strength of the ebb current is usually reached at the southing (transit) of the moon and the strength of the flood 6 hours later.

Off Chatham Lighthouses 2 knots per hour, and off Cape Cod Lighthouse 1 knot per hour may be expected at strength.

MONOMOY AND NANTUCKET SHOALS.*

To the eastward and southeastward of the eastern entrance to Nantucket Sound are numerous and extensive shoals known as Monomoy and Nantucket shoals. Owing to the great extent and distance of some parts of these shoals from the land and to the strong and baffling tidal currents which set over them, their navigation in thick or foggy weather is very hazardous. In clear weather the lighthouses, light-vessels, and buoys render the navigation of the two principal channels comparatively easy, but care must be taken not to be set out of the channels by the currents. The principal (south) channel leads through these shoals in a nearly due E. direction from Nantucket (Great Point) Lighthouse, and for the purpose of description will be considered as the dividing line between Nantucket and Monomoy shoals, which are briefly described under separate headings.

MONOMOY SHOALS

consists of numerous detached shoals of a shifting character with 3 to 18 feet over them, and extending about $5\frac{1}{2}$ miles in an easterly and $9\frac{1}{2}$ miles in a southeasterly and south-southeasterly direction from Monomoy Point. Many parts of these shoals, separated from others by narrow slues, have special names and are briefly described below.

Bearses Shoal is the western and **Pollock Rip** the eastern, part of the shoal extending from $\frac{1}{2}$ mile to $3\frac{1}{2}$ miles to the eastward of Monomoy Lighthouse. These shoals consist of a series of sand shoals and sand ridges with 3 to 18 feet of water over them and deep water between them. The northeastern and southeastern extremities of Pollock Rip lie $3\frac{1}{2}$ miles E NE. $\frac{1}{2}$ E. and SE. by E. $\frac{1}{2}$ E. respectively from Monomoy Point Lighthouse.

Broken Part of Pollock Rip, with depths of 12 to 18 feet over it, lies to the eastward of Pollock Rip, and is separated from it by Pollock Rip Slue, which has a width of about $\frac{1}{2}$ mile and a depth of $3\frac{1}{2}$ to 6 fathoms.

Twelve-feet Shoal, to the southward of the Broken Part of Pollock Rip, has $11\frac{1}{2}$ to 18 feet over it and lies 5 miles SE. $\frac{1}{2}$ E. from Monomoy Point Lighthouse.

Broken Rip, with depths of about 13 to 18 feet over it, lies about $\frac{1}{2}$ mile to the southward of Twelve-feet Shoal.

Stone Horse Shoal, **Little Round Shoal** and **Great Round Shoal** are portions of a continuous series of sand shoals and sand ridges with depths of 4 to 18 feet over them, lying directly to the eastward of the entrance of Nantucket Sound and between the two main channels. Stone Horse Shoal and Little Round Shoal lie on the south side of the deep-water channel between them and Pollock Rip. Great Round Shoal lies about $7\frac{1}{2}$ miles in a S SE. direction from Monomoy Point Lighthouse; to the southward and eastward of this shoal for a distance of about $2\frac{1}{2}$ miles there are numerous shoal spots with depths varying from $11\frac{1}{2}$ to 18 feet over them.

Orion Shoal is a small shoal spot with 17 feet over it, lying $9\frac{1}{2}$ miles SE. $\frac{1}{2}$ S. from Monomoy Point Lighthouse and a little more than $10\frac{1}{2}$ miles nearly E. by N. from Nantucket Lighthouse. About $1\frac{1}{2}$ miles E. from the shoal is a red bell buoy.

An 18-foot spot lies $2\frac{1}{2}$ miles SE. from Orion Shoal, and the depth between them ranges from $3\frac{1}{2}$ to 8 fathoms. About $\frac{1}{2}$ mile S. from the 18-foot spot is a buoy (red, No. 4), which is one of the buoys marking the South Channel.

Shoalwater Shoal, extending nearly $\frac{1}{2}$ mile to the southward from Monomoy Point, is bare in places and rises abruptly from the deep water of Butlers Hole.

Handkerchief Shoal, to the southwestward of Monomoy Point, is described under section 1, page 72.

NANTUCKET SHOALS

consist of numerous sand shoals and long narrow sand ridges lying to the eastward, southeastward, and southward of the eastern end of Nantucket Island, and at distances varying from 1 to 20 miles from the shores of that island.

* Shown on charts 7, scale $\frac{1}{400,000}$, price \$0.50; 111, scale $\frac{1}{80,000}$, price \$0.50; and in part on charts 215, scale $\frac{1}{80,000}$, price \$0.50; 259, scale $\frac{1}{40,000}$, price \$0.30.

The common features of the sand ridges are that their greatest length is generally in a northerly and southerly direction and that they rise abruptly from deep water. Many of the shoals are separated by deep-water slues, but they are too crooked and the currents too strong and variable to permit of navigation. Portions of these shoals have special names and are briefly described as follows:

McBlair Shoal, the most northern of the Nantucket Shoals, lies $9\frac{1}{2}$ to $11\frac{1}{2}$ miles E. $\frac{1}{2}$ S. from Nantucket Lighthouse, and consists of numerous sand spots with depths over them ranging from 15 to 18 feet. Near the eastern extremity of the shoal is black buoy No. 5, and near its western extremity is black buoy No. 7, both on the southern side of the channel leading between Monomoy and Nantucket Shoals.

Rose and Crown, two detached shoals with depths of 4 to 18 feet over them, lie about 10 miles to the eastward of Sankaty Head Lighthouse, they are about 5 miles in extent in a northerly and southerly direction and not more than $1\frac{1}{2}$ miles in an easterly and westerly direction. The northern end of the shoal lies about 5 miles in a general S. by E. direction from McBlair Shoal, but between them there are numerous shoal spots with 11 to 17 feet of water over them.

Great Rip, the shoal spots lying 3 to 7 miles to the southward of Rose and Crown, has depths of 12 to 18 feet over it.

Bass Rip, lying about $2\frac{1}{2}$ miles to the eastward of the southeastern end of Nantucket Island, has 6 to 18 feet of water over it, is nearly 4 miles long in a N. and S. direction and not over $\frac{1}{2}$ mile wide at any part.

Old Man Shoal consists of the numerous shoal spots, extending from a point about 1 mile off the southeastern end of Nantucket Island, in a general southwesterly direction for about 6 miles. The depths on this shoal range from 6 to 18 feet.

Old South Shoal, with 7 to 18 feet of water over it and $3\frac{1}{2}$ to 6 fathoms around it, is about 3 miles long, and its shoalest part lies 13 miles S. by E. from Sankaty Head Lighthouse.

Davis South Shoal, with 15 to 18 feet over it, is the southernmost of the Nantucket Shoals, its shoalest part lying a little over 20 miles S. $\frac{1}{2}$ E. from Sankaty Head Lighthouse. Depths of $5\frac{1}{2}$ to 7 fathoms are found 8 miles to the southwestward of this shoal, and 12 miles about S SW. $\frac{1}{2}$ W. of the shoal is Nantucket New South Shoal Light-vessel (see table, page 12).

Davis Bank, lying 18 miles in a general southeasterly direction from Nantucket Island, is about 20 miles long in a N. and S. direction, has a general depth of about 5 fathoms, and is surrounded by depths varying from 11 to 20 fathoms. Near its northern end, $15\frac{1}{2}$ miles E. $\frac{1}{2}$ S. from Sankaty Head Lighthouse, there is a spot with only 16 feet of water over it. For a distance of 3 miles to the northward of this spot 4 fathoms will be found.

Fishing Rip is a narrow bank with depths over it ranging from 4 to 10 fathoms, ruling depth being about 6 fathoms; the depth around it ranges from 16 to 21 fathoms. Its northern end lies 27 miles SE. by E. from Sankaty Head Lighthouse, and the bank extends over 10 miles in a southwesterly direction.

Phelps Bank is not a danger to navigation, nor can it be considered as a part of Nantucket Shoals, but soundings on it might be a warning to vessels approaching those shoals from a southeasterly direction. **Asia Rip** has a depth of 10 fathoms over it and is on the southern end of the bank in about lat. $40^{\circ} 47' N.$ long. $69^{\circ} 23' W.$ and is about 25 miles E. $\frac{1}{2}$ S. from Nantucket New South Shoal Light-vessel (see page 12). From Asia Rip, Phelps Bank extends about 10 miles in a general northeasterly direction, is less than $\frac{1}{2}$ mile wide at its widest part, and is surrounded by depths of from 24 to 30 fathoms.

Channels.—There are two principal channels leading from the eastward into Nantucket Sound, known as Monomoy Passage and Main or South Channel.

Monomoy Passage is a general name for the passage through Pollock Rip Slue, Butlers Hole, and the deep water channel joining the two. **Pollock Rip Slue** leads between Pollock Rip on the W. and Broken Part of Pollock Rip on the E., is about $\frac{1}{2}$ mile wide, and has a depth of $4\frac{1}{2}$ to 6 fathoms. It is marked by buoys and its entrance is 4 miles E. $\frac{1}{2}$ S. from Monomoy Point Lighthouse. The passage from the southern end of Pollock Rip Slue to the northeastern entrance to Butlers Hole has a length of about 3 miles and a width of about $1\frac{1}{2}$ miles between Pollock Rip and Bearers Shoal on the N. and Little Round and Stone Horse shoals on the S.; the eastern end of the passage is marked by Pollock Rip Light-vessel, the western by Shovelful Shoal Light-vessel. **Butlers Hole**, the passage between Shovelful Shoal and Stone Horse Shoal, is about $\frac{1}{2}$ mile wide and extends about 4 miles in a SW. by W. direction to the deep water at the eastern end of Nantucket Sound; it has depths varying from $4\frac{1}{2}$ to 24 fathoms. In clear weather when the aids can be seen $4\frac{1}{2}$ fathoms can be carried into Nantucket Sound through Monomoy Passage. There is a narrow passage with a least depth of $3\frac{1}{2}$ fathoms leading between the southern part of Broken Part of Pollock Rip and Twelve-foot Shoal, and although buoyed it is not much used.

South or Main Channel leads into Nantucket Sound between Monomoy and Nantucket Shoals. A number of buoys are placed to the northeastward of McBlair Shoal to indicate the best water of this channel, and the entrance is marked by a whistling buoy which lies $15\frac{1}{2}$ miles E. $\frac{1}{2}$ S. from Nantucket Lighthouse. The course from this buoy to Great Round Shoal Light-vessel is W. By this channel a least depth of 5 fathoms can be carried into Nantucket Sound.

Tidal Currents.—To the northward of Pollock Rip the general set of the flood is to the eastward of NE. and of the ebb a little to the westward of SW. To the southward of McBlair Shoal the flood sets to the northward of NE.

and the ebb to the southward of **SW**. The current sets in all directions of the compass during the twelve lunar hours, without ever being at rest; turning from **N**. to **E**. and **S**. to **W**. (with the hands of a watch). About 4 knots is the greatest velocity observed; this was on the rips to the eastward of Nantucket Island. About 3 hours after the currents turn they acquire their greatest velocity.

NANTUCKET AND VINEYARD SOUNDS*

lie between the south coast of Cape Cod and the Elizabeth Islands on the north, and Nantucket Island and Marthas Vineyard on the south; their combined length from Monomoy Point to Cuttyhunk is about 43 miles. At the eastern entrance of Nantucket Sound are the Monomoy and Nantucket shoals, and in the sounds are numerous shoals, but well marked channels lead between them, making the navigation of these waters, in clear weather and with a fair wind, comparatively easy to the westward of Monomoy Shoals. The most important of the shoals are described in connection with the sailing directions through the sounds or for the harbors. The sounds are a thoroughfare for coasting vessels bound to ports east of Cape Cod and returning bound to the southward, many thousands of vessels passing through both ways each year. The depth of water is sufficient for the largest vessels and the route is more direct, for vessels bound along the coast, than outside of Nantucket Shoals. Pilots or towboats, and sometimes both, are often employed by large square-rigged vessels bound along the coast in ballast.

NANTUCKET SOUND

is the body of water lying between the south shore of Cape Cod and Nantucket Island. Its eastern entrance is between Monomoy Point and Great Point, and it extends to the westward about 26½ miles, joining Vineyard Sound to the northward of West Chop. Between Monomoy Point and Great Point it is 9½ miles wide, but a little farther to the westward it is 20 miles wide; at Cape Poge it is 8 miles wide and to the northward of West Chop about 3½ miles.

The north shore of Nantucket Sound, between Chatham and Succunnesset Point, is generally low and sandy, backed by wooded hills; it is well settled and the church spires some distance back from the beach form conspicuous landmarks when standing along the shore. The principal towns and villages west of Chatham and near the coast are: Harwich Port, Dennis Port, South Yarmouth, West Yarmouth, Hyannis, Centerville, Osterville, Cotuit Port, and Falmouth. These towns have small vessels engaged in fishing and but little commerce, except Hyannis, which employs a number of vessels in carrying coal and general merchandise. Shoal water extends out in some cases for a distance of 2 miles from the shore. To the eastward of Bishop and Clerks Lighthouse, the water shoals gradually when approaching the beach; near the lighthouse and to the westward of it, shoal spots with 5 to 18 feet of water over them lie off shore with channels between them through which 3½ to 7 fathoms can be taken, but a vessel of over 15 feet draught should not attempt to pass to the northward of Bishop and Clerks Lighthouse unless well acquainted with the locality.

Nantucket Island, forming the southern shore of Nantucket Sound, is of irregular shape, lies nearly **E**. and **W**., and is about 15 miles long. It is widest at its eastern end, where, from Great Point to the southeastern point of the island, the distance is about 9½ miles; but it gradually diminishes in width from this to the westward until it terminates in a narrow strip of sand abreast of Tuckernuck Island. Great Point (marked by Nantucket Lighthouse, see page 12) is the northern point of the island and is the extremity of a long, narrow sand beach making out about 3½ miles from the main body of the island. The surface of the island is hilly (none of the hills being over 100 feet in height, however) and undulating, diversified with woods and cleared slopes, with steep sand cliffs on its northern and eastern sides. The highest part of the island is near the eastern end. About 5 miles **S**. by **E**. ½ **E**. from Nantucket Lighthouse is Squam Head, a cliff rising about 40 feet nearly vertically from the water's edge, and on it is a large house with a cupola. About 2½ miles **S**. by **E**. ½ **E**. from the cupola is a hill rising abruptly from the water's edge to a height of 90 feet, and on it is Sankaty Head Lighthouse (see page 12). On the northern side of the island, the land, though undulating, is low and sandy, and for the most part bare of trees. Vessels coming in through Butlers Hole see nothing of Nantucket Island but Great Point and Sankaty Head, and that only on clear days; those coming in by the main channel will on clear days see Sankaty Head, the house on Squam Head, Great Point, the life-saving station to the southward of Nantucket Lighthouse, and broken, abrupt cliffs of moderate height.

To the westward of Nantucket Island, and separated from it and each other only by sand bars, are Tuckernuck, Gravel, and Muskeget islands.

Nantucket Island is almost surrounded by shoals; those which lie to the eastward and southeastward of it (described on page 67), make it one of the most dreaded parts of the coast. The shoals in the sound are sufficiently described in connection with the sailing directions.

The only harbor on the shore of Nantucket Island is Nantucket Harbor (see heading).

Channels.—The shoals extending nearly 4 miles to the southwestward from Monomoy Point and the shoal making off 3 miles to the northeastward from Great Point contract the entrance of Nantucket Sound to a width of 5½ miles.

* Shown on charts 111 and 112, scale $\frac{1}{80,000}$, price of each \$0.50. See also footnote on page 9.

Extending across the sound to the westward of Nantucket Island is an irregular line of shoals, between which are two well marked channels with good water. The **North Channel** leads to the northward of Bishop and Clerks Lighthouse and follows the south shore of Cape Cod to the northward of the principal shoals in the sound. It is mostly used in northerly winds and in winter, when the prevailing northerly winds keep the south shore of Cape Cod free from drift ice. The least depth in this channel, near Bishop and Clerks Lighthouse, is about 16 feet. The **Main Channel** leads through an opening in the shoals near the middle of the sound and is marked by Cross Rip Light-vessel. A least depth of 5½ fathoms can be carried on the sailing line from Handkerchief Light-vessel through this channel. Just to the westward of Monomoy Point is a **narrow buoyed channel** with a depth of about 10 feet; it leads to the northward between Shovelful and Handkerchief shoals and is an approach to Chatham Roads and to the North Channel through the sound. Between Muskeget Island and Chappaquiddick Island there is an opening nearly 6 miles wide, known as **Muskeget Channel**. It is full of shifting shoals, the best water being close to the eastward of Wasque Shoal, and a little to the eastward of the eastern shore of Chappaquiddick Island. This channel is partly buoyed, but should never be attempted by strangers, as the currents are very strong and variable in direction and make the navigation of it extremely dangerous. **Wasque Shoal** lies to the southward of **Wasque Point** (the southeastern point of Chappaquiddick Island) and rises abruptly on its southern and eastern sides from a depth of 3 and 8 fathoms to 2 and 4 feet. On its eastern edge is a small sand island, called **Skiffs Island**, which almost disappears at times. Near the western end of the sound are three shoals extending in a general **W NW.** and **E SE.** direction, between which are four good channels which unite at the entrance to Vineyard Sound and may be used by vessels passing through.

VINEYARD SOUND

joins Nantucket Sound to the northward of West Chop and extends to the westward between the south shore of Cape Cod and the Elizabeth Islands on the north and Marthas Vineyard on the south, its western limit being a line from Gay Head to Cuttyhunk. The sound is about 17 miles long and the width varies from 7 miles to a little less than 3 miles abreast Nobska Point Lighthouse, its narrowest part.

Marthas Vineyard is a large irregular shaped island about 18 miles long **E. and W.** and 7½ miles wide at its widest part. It is well settled, especially along its northern shore. The principal towns are Edgartown, Vineyard Haven, and Cottage city, the last being an important summer resort. **Cape Poge**, generally spoken of as the northeastern point of Marthas Vineyard, is really the northern point of **Chappaquiddick Island**, which is separated from Marthas Vineyard by Edgartown Harbor and **Katama Bay**, and the narrow strait connecting them. The opening from the sea into Katama Bay has sometimes been closed, but now there is a shallow opening through which fishing boats pass in smooth water at high tide. **East Chop** and **West Chop**, at the entrance to Vineyard Haven, are the two northernmost points on the island and each is marked by a lighthouse. **Gay Head**, the northwestern point of the island, and one of the most remarkable headlands along the Atlantic coast, is marked by a lighthouse and is a prominent landmark for entering Vineyard Sound from the westward. Seen from this direction the light-colored bare bluff shows clearly between the darker land on either side. About 5 miles **S.** from Gay Head is **No Mans Land**, a high, rocky, barren island, which is a prominent landmark from seaward. A couple of buoyed ledges lie between No Mans Land and the southwestern end of Marthas Vineyard. The south shore of the island is unimportant and seldom approached by vessels, as it is out of the track of navigation.

The **Elizabeth Islands** extend in a general **W SW. ¼ W.** direction about 15 miles from Woods Holl, the southwestern end of Cape Cod. They are known separately as **Nonamesset**, **Uncatena**, **Naushon**, **Pasque**, **Nashawena**, and **Cuttyhunk** islands, and separate the western part of Vineyard Sound from Buzzards Bay. The southern shores of these islands are comparatively bold-to, and in Naushon, the largest, is **Tarpaulin Cove**, a small anchorage used in northerly winds and as an anchorage for the night. Near the western end of Cuttyhunk Island is a lighthouse which serves as a guide for the entrances to Buzzards Bay and Vineyard Sound. The channels leading between the islands are treated separately.

Channels.—To the westward of West Chop the channel follows the shores of the Elizabeth Islands; shoals lie off the shore of Marthas Vineyard to the westward of West Chop. There are three passages from Vineyard Sound into Buzzards Bay between the Elizabeth Islands; these are known as Woods Holl, Robinsons Hole, and Quicks Hole.

Anchorage in Nantucket and Vineyard sounds.—Vessels working through the sounds against a head wind usually anchor during the night, or if becalmed and drifting towards the shoals, it is best to anchor and wait for a favorable tide or change of wind. There are no anchorages for vessels of over 10 feet draught that afford shelter from all winds, except the inner harbor of Edgartown and Woods Holl. Vineyard Haven, the anchorage most used by coasters, is exposed to northeasterly winds. In *northerly winds* the best anchorages are off Dennis Port, Hyannis Port, along the north shore, and in Tarpaulin Cove. The anchorage off Falmouth is used in all winds by large vessels with good ground tackle. In *easterly winds* vessels sometimes anchor in smooth water to the westward of Handkerchief Shoal; good shelter is found in Chatham Roads and Edgartown outer harbor. In *southerly winds* Edgartown Harbor and Vineyard Haven are the best anchorages; Menemsha Bight affords shelter and is sometimes

used by vessels in the western end of Vineyard Sound. In westerly winds Edgartown, Vineyard Haven, and Tarpaulin Cove are good anchorages. These harbors can be entered by a stranger assisted by the chart or following the directions under the different headings. Nantucket Harbor can only be entered by light draught vessels with comparatively smooth water.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced in entering and passing through the sounds. The lights are numerous and readily distinguished (see table, pages 12–14). The buoyage accords with the system adopted for United States waters (see page V).

Pilots and pilotage.—Pilotage is not compulsory for vessels passing through the sounds; it is only compulsory for certain vessels entering or clearing from the ports (see laws relating to "Pilots and Pilotage" in Appendix I). Pilots for the sounds or Monomoy and Nantucket shoals can be found at Provincetown or Boston by vessels coming from the northward, or at Tarpaulin Cove, or Vineyard Haven, coming from the westward.

Towboats.—Vessels towing usually take a towboat from the port of their departure. A powerful tug may generally be found at Woods Holl or Vineyard Haven during the winter to assist vessels that may be aground or in trouble.

Repairs.—There is a marine railway at Vineyard Haven capable of hauling out vessels of about 400 tons. The nearest place at which light repairs to the machinery of steamers can be made is at New Bedford.

Supplies.—Coal can be obtained at Nantucket, Hyannis, Edgartown, and Vineyard Haven. Provisions and ship chandlers' stores can be had at these places.

Wind signals.—A list of the display stations of the U. S. Weather Bureau from which wind signals are shown is given on page 20.

Winds.—The prevailing winds are northwesterly and northerly in winter and southerly in summer, subject to changes at all seasons.

Fogs are liable to occur at any time, but are more frequent from April to October than during the remainder of the year. They come more frequently with easterly and southerly winds; northerly winds clear them away.

Ice.—In mild winters ice interferes but little with the movements of vessels in Nantucket and Vineyard sounds. In severe winters, as 1856–57 and 1874–75, drift ice accumulates and renders the movements of sailing vessels extremely hazardous, and sometimes almost completely obstructs their progress for periods of as much as six weeks. During northerly winds, which prevail in winter, the passage along the north shore through Nantucket Sound will be clear when other parts of the sound are unsafe. Steamers can usually force their way through the ice. Sailing vessels, if caught in a floe while entering by Monomoy Passage, are almost certain to be carried on the shoals.

It should be borne in mind that the buoys and even light-vessels are liable to be moved out of their positions by drift ice.

CURRENT TABLE—NANTUCKET

[The set is magnetic and the drift in

TIMES REFERRED TO HIGH AND LOW WATER AT BOSTON.	LOCALITY OF CURRENT STATION.							
	4½ miles SE. ½ S. from Chatham Lighthouses.		½ mile SE. by E. from Pollock Rip Light-vessel.		1½ miles S. by W. ½ W. from Mono- moy Point Lighthouse.		3½ miles N. by W. ½ W. from Nan- tucket (Great Point) Lighthouse.	
	Set.	Drift.	Set.	Drift.	Set.	Drift.	Set.	Drift.
High water.....	S. by W. ½ W.	1.2	SW. by W.	1.5	W. by S.	1.6	W. by S.	0.4
1 hour after high water.....	S. by W. ½ W.	1.0	SW. ½ W.	1.6	W SW	2.1	W. by S.	0.8
2 hours after high water.....	SW. by S.	0.5	W SW	1.4	SW. by W.	2.0	W. ½ S.	1.0
3 hours after high water.....	S SW	0.1	W. by S.	0.7	SW. by W. ½ W.	1.1	W	0.8
2 hours before low water.....	N NE	0.3		0.3		0.4	W. by N	0.4
1 hour before low water.....	N NE	0.7	NE. by E.	0.9	NE. ½ E.	0.6		0.0
Low water.....	N NE	1.0	ENE	1.3	NE. by E. ½ E.	1.3	E. by N	0.4
1 hour after low water.....	N. by E. ½ E.	0.9	E. ½ N.	1.4	ENE	1.7	E	0.8
2 hours after low water.....	N. by E. ½ E.	0.5	E. ½ N.	1.4	ENE	1.6	E. by S	1.0
3 hours after low water.....		0.1	E. by S	1.1	NE. by E.	1.1	E. by S	1.1
2 hours before high water.....	SW. by S.	0.2	SE. by S	0.8	ENE	0.7	E SE	0.7
1 hour before high water.....	S. by W. ½ W.	1.0	SW. ½ W.	1.3	WNW	0.9		0.1

NOTE.—The current turns from ½ to 1 hour earlier near East and West Chop than in the ship channel. Near the Devil Bridge at Gay Head the current turns 1 hour earlier than in the middle of the channel into the sound.

SAILING DIRECTIONS ENTERING OR PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS FROM THE EASTWARD.*

Monomoy and Nantucket Shoals are described on pages 66–67, and the channels through them on page 67.

1. Coming from the Northward and Entering by Pollock Rip Slue and Butlers Hole to Cross Rip Light-vessel.—Give the eastern shore of Cape Cod a berth of about 2 miles, and when Cape Cod Lighthouse bears **W.** steer **S.** by **E.** This course made good for about 12 miles should lead about 2 miles to the eastward of Nauset Beach Lighthouses, and when they bear **NW.** by **W.**, distant about $2\frac{1}{2}$ miles, the course should be changed to **S.** by **W.** This course made good for 16 miles should lead $\frac{1}{4}$ mile to the westward of the whistling buoy to the northeastward of Pollock Rip Slue. From this buoy steer **SW.** $\frac{1}{2}$ **W.** about $1\frac{1}{2}$ miles for the black bell buoy at the entrance to the slue. Leave the bell buoy 200 to 300 yards on the port hand and steer **S.** by **W.** $\frac{3}{4}$ **W.** for 1 mile until red buoy No. 2 is a little abaft the starboard beam and Pollock Rip Light-vessel bears **SW.** by **W.** $\frac{1}{2}$ **W.**, when steer for the light-vessel, leaving red buoy No. 4 on the starboard hand.

Pass Pollock Rip Light-vessel on either hand and with it over the stern steer **WNW.** $\frac{1}{2}$ **W.** for Shovelful Shoal Light-vessel. Pass close to the northward of Shovelful Shoal Light-vessel, haul sharply to the southward and with it over the stern steer **SW.** by **W.** $\frac{1}{2}$ **W.** for Handkerchief Shoal Light-vessel. Pass to the southward of this light-vessel and with it over the stern, bearing **E.** $\frac{3}{4}$ **N.**, steer **W.** $\frac{3}{4}$ **S.** until Cross Rip Light-vessel bears **W.** by **N.**, when steer for it; pass it close to on either hand, and then follow the directions in sections 2 and 3, following.

If bound through the sounds along the north shore, when up to Handkerchief Light-vessel, follow the sailing directions in sections 1 and 2, pages 74 and 75.

At night no vessel should attempt to enter through Pollock Rip Slue unless the whistling and bell buoy near the entrance can be made. To make the whistling buoy, make good a course of **S.** $\frac{1}{8}$ **W.** from abreast Nauset Beach Lights, until the red rays of Monomoy Point Light are entered, then follow to the westward on the edge of the red and white rays of that light until the whistling buoy is made, remembering that Pollock Rip Light-vessel should bear **SW.** when up to the whistling buoy. From this buoy steer **SW.** for the bell buoy, and then steer **S.** by **W.** $\frac{1}{2}$ **W.** until the lights of Pollock Rip Light-vessel and Shovelful Shoal Light-vessel are in range, then stand in as directed above.

AND VINEYARD SOUNDS.

nautical miles and tenths per hour.]

LOCALITY OF CURRENT STATION—Continued.									
$\frac{1}{2}$ mile S SW. from Handkerchief Light-vessel.		$4\frac{1}{2}$ miles NW. by W. $\frac{1}{2}$ W. from Hand- kerchief Light-vessel.		3 miles E. $\frac{1}{2}$ N. from East Chop Lighthouse.		$2\frac{1}{2}$ miles S. $\frac{1}{2}$ W. from Nobska Lighthouse.		$2\frac{1}{2}$ miles N. $\frac{1}{2}$ W. from Gay Head Lighthouse.	
Set.	Drift.	Set.	Drift.	Set.	Drift.	Set.	Drift.	Set.	Drift.
$\frac{1}{2}$ S	1.1	-----	0.0	-----	0.2	SW	0.8	-----	0.3
W	1.2	WNW	0.1	WNW	0.5	W. by S	1.5	W	0.5
W. $\frac{1}{2}$ N	1.1	NW. by W	0.5	WNW. $\frac{1}{2}$ W	1.4	WSW. $\frac{1}{2}$ W	2.2	WNW	1.2
W. $\frac{1}{2}$ S	0.7	NW. by W	0.5	W. $\frac{1}{2}$ N	1.5	WSW	2.3	WNW	1.3
W. $\frac{1}{2}$ N	0.1	NW. by N	0.1	WNW	1.4	WSW. $\frac{1}{2}$ W	1.7	W	0.8
NE. $\frac{1}{2}$ E	0.6	NE	0.1	WNW	0.9	W. $\frac{1}{2}$ S	1.0	W. $\frac{1}{2}$ S	0.4
E. by N	0.9	ENE	0.3	-----	0.0	-----	0.3	-----	0.4
E. $\frac{1}{2}$ S	0.9	ENE. $\frac{1}{2}$ E	0.5	ENE. $\frac{1}{2}$ E	0.8	ENE. $\frac{1}{2}$ E	1.1	NE. by E	0.8
E	1.0	ENE. $\frac{1}{2}$ E	0.6	ENE	1.1	NE. by E. $\frac{1}{2}$ E	1.4	NE by E. $\frac{1}{2}$ E	1.0
E	1.0	E. $\frac{1}{2}$ N	0.6	ENE	1.2	NE. by E. $\frac{1}{2}$ E	1.4	NE. by E. $\frac{1}{2}$ E	1.1
ESE	0.7	E. by N	0.5	ENE. $\frac{1}{2}$ E	0.9	ENE	1.0	ENE	0.9
SW. $\frac{1}{2}$ W	0.4	ENE	0.2	ENE. $\frac{1}{2}$ E	0.6	ENE	0.5	E. by N	0.6

* Directions for passing through the sounds along the north shore follow after the directions for the main passage.

Remarks.—The east shore of Cape Cod is described on pages 65-66.

The S. by W. course will lead about $\frac{1}{2}$ mile to the eastward of the whistling buoy off Chatham Bar, and about $2\frac{1}{2}$ miles to the eastward of Chatham Lighthouses. When up to the whistling buoy off Pollock Rip Slue, Monomoy Point Lighthouse will bear W. $\frac{1}{2}$ S. and Pollock Rip Light-vessel SW.

On the SW. course Pollock Rip Light-vessel and the bell buoy at the entrance to the slue will be directly ahead; the buoy should be left on the port hand.

On the W NW. $\frac{1}{2}$ W. course, Shovelful Shoal Light-vessel should be right ahead, and Monomoy Point Lighthouse a little on the starboard bow, with the low sand beach of Monomoy Point showing to the southward of the lighthouse. In coming in as directed, Nantucket Lighthouse should be seen to the southwestward.

When standing SW. by W. $\frac{1}{2}$ W. for Handkerchief Shoal Light-vessel, several red buoys near the entrance to the passage between Shovelful and Handkerchief shoals will be left well on the starboard hand ~~and a wreck buoy about $\frac{1}{2}$ mile on the port hand.~~

The W. by N. course leads $\frac{1}{2}$ mile to the southward of the buoy (red, No. 12) on the southeastern end of Horseshoe Shoal.

Dangers.—There are no dangers near the sailing lines until near the bell buoy, at the entrance to Pollock Rip Slue. This slue leads between Pollock Rip and Broken Part of Pollock Rip (see descriptions on page 66).

For descriptions of Bearses and Shovelful shoals to the northward of the sailing lines and Stone Horse Shoal and Little Round Shoal to the southward of the sailing lines, see Monomoy and Nantucket Shoals, page 66.

Handkerchief Shoal is the extensive shoal ground, with from 3 to 18 feet over it, lying to the southwestward of Monomoy Point. It is about 4 miles long N. and S., and its greatest width is about 2 miles. Its southern end, which rises abruptly from a depth of 8 fathoms to 7 feet, is about $\frac{1}{2}$ mile to the northward of Handkerchief Shoal Light-vessel and 5 miles SW. $\frac{1}{2}$ W. from Monomoy Point Lighthouse, and is marked by a buoy (red, No. 10). Its northern end, rising gradually from 3 $\frac{1}{2}$ fathoms to 15 feet, lies 3 miles W NW. $\frac{1}{2}$ W. from Monomoy Point Lighthouse, and is marked by a buoy (black, No. 3). On the eastern edge of the shoal are two buoys, which mark the channel between it and Shovelful Shoal and Monomoy Point.

1 A. *Approaching and Entering by the South Channel.*—Coming from the northward steer so as to pass about 2 miles to the eastward of Cape Cod Lighthouse and then steer S. by E. for about 12 miles and pass about 2 miles to the eastward of Nauset Beach Lighthouses.

When Nauset Beach Lighthouses bear NW. by W. distant about $2\frac{1}{2}$ miles steer S. $\frac{1}{2}$ E. This course made good for about 26 miles should lead up to the whistling buoy at the entrance to the South Channel. From this buoy make good a W. course, leaving the red buoys (Nos. 2, 4, and 6) on the starboard hand and black buoys (Nos. 1, 3, 5, and 7) on the port hand. The channel between these red and black buoys is about 1 mile wide and has a least depth of 6 $\frac{1}{2}$ fathoms.

Great Round Shoal Light-vessel (see table, page 12) should be made right ahead and Nantucket Lighthouse a very little on the starboard bow; by keeping to the northward of the range of the two all danger from McBlair Shoal is avoided.

Pass close to the southward of Great Round Shoal Light-vessel, bring it to bear SE. and steer NW., keeping it on that bearing astern until Nantucket Lighthouse is abeam (bearing SW.), then make good a W NW. $\frac{1}{2}$ W. course. Cross Rip Light-vessel should be made right ahead and kept on that bearing. When up to it pass close to the southward of it and proceed as directed in section 2, following.

If desiring to pass through the sounds along the north shore continue the NW. course from Great Round Shoal Light-vessel until about $\frac{1}{2}$ mile to the southward of Handkerchief Light-vessel, then follow the directions in section 1 and 2 of the sailing directions for that route, pages 74-75.

The above directions can be easily followed by day or by night in clear weather. If the whistling buoy is not made bring Great Round Shoal Light-vessel to bear W. as soon as it is made and steer for it, keeping the bearing.

Remarks.—The S. $\frac{1}{2}$ E. course leads $5\frac{1}{2}$ miles to the eastward of Chatham Lighthouses and about the same distance to the eastward of Broken Part of Pollock Rip and Twelve-foot Shoal. If the whistling buoy is not made, a vessel should manage to pick up some of the channel buoys lying $1\frac{1}{2}$ to $3\frac{1}{2}$ miles farther to the westward.

Great care should be taken not to be set off the course by the strong tidal currents.

The W. course leads about $\frac{1}{2}$ mile to the northward of McBlair Shoal (see page 67), which is often marked by tide rips. As Great Round Shoal Light-vessel is approached the cupola on Squam Head and Nantucket Lighthouse should be seen, but very little of shore line will be visible.

The NW. course leads directly for the bell buoy (black and white perpendicular stripes) which lies 4 miles NE. from Nantucket Lighthouse.

On the W NW. $\frac{1}{2}$ W. course for Cross Rip Light-vessel, Handkerchief Light-vessel will be left about $2\frac{1}{2}$ miles on the starboard hand and Nantucket Lighthouse about $3\frac{1}{2}$ miles on the port hand. When within $2\frac{1}{2}$ miles of Cross Rip Light-vessel you should be about $\frac{1}{2}$ mile to the southward of Horseshoe Shoal (SE.) buoy (red, No. 12).

For tidal currents see pages 67-68.

Dangers.—General descriptions of Nantucket and Monomoy shoals are given on pages 66-67, and detailed description would be of no particular value; the directions above lead well clear of all of them.

2. *From Cross Rip Light-vessel to abreast Nobska Point Lighthouse.*—Having followed the directions in section 1 or 1A preceding, pass close to the southward of Cross Rip Light-vessel, then bring it to bear **ESE. $\frac{3}{4}$ E.** and steer **WNW. $\frac{3}{4}$ W.** keeping it on the bearing astern until Nobska Point Lighthouse bears **NW. by W. $\frac{3}{4}$ W.** This lighthouse should be brought on this bearing before Cape Poge Lighthouse bears to the eastward of **S. by E.**, in order to insure clearing Hedge Fence and Squash Meadow.

With Nobska Point Lighthouse bearing **NW. by W. $\frac{3}{4}$ W.** steer for it, keeping it on that bearing until West Chop Lighthouse bears **S.** distant about $1\frac{1}{4}$ miles, then steer **W. $\frac{1}{2}$ N.** until Nobska Point Lighthouse bears **N. by E.**, when proceed as directed in section 3, following.

At night.—The above directions can be as easily followed at night as in daytime.

On the **WNW. $\frac{3}{4}$ W.** course West Chop Light will be directly ahead, and you should enter the white rays of Nobska Point Light before crossing the line joining Edgartown Light and Succunneset Shoal Light-vessel and should keep out of the red rays of West Chop Light.

The **NW. by W. $\frac{3}{4}$ W.** course leads along on the edge of the red rays of Nobska Point Light.

Remarks.—In passing Cross Rip Light-vessel, pass between it and the black buoy (No. 9) on the northern end of Cross Rip Shoal.

The **WNW. $\frac{3}{4}$ W.** course leads about $1\frac{1}{4}$ miles to the northward of Norton Shoal, about 1 mile to the southward of Horseshoe Shoal and $2\frac{1}{4}$ miles to the northward of Cape Poge Lighthouse.

The **NW. by W. $\frac{3}{4}$ W.** course leads about 1 mile to the northward of Squash Meadow and about the same distance to the northward of East Chop and West Chop lighthouses, and about $\frac{1}{2}$ mile to the southward of Hedge Fence, which has 3 to 13 feet over it.

Dangers.—Horseshoe Shoal is the name of the extensive shoals lying in the west central part of Nantucket Sound. It extends about $8\frac{1}{4}$ miles in a general **NW.** and **SE.** direction, but there are narrow slues with depth of 3 to 8 fathoms crossing it, thus cutting it into a number of shoal patches. The depth on the shoals is very irregular, but many of the shoalest parts have only 2 to 5 feet, and near its northwestern extremity it rises abruptly from a depth of 12 fathoms to $\frac{1}{2}$ foot. At this extremity it is marked by a black buoy (No. 9); this buoy lies about $2\frac{1}{4}$ miles **E. $\frac{1}{2}$ S.** from Succunneset Shoal Light-vessel. From the buoy an arm of the shoal extends eastward $3\frac{1}{4}$ miles; on its northern side it rises very abruptly from 5 and 11 fathoms to 8 and 15 feet. A little to the eastward of the eastern extremity of the arm there are several spots with 16 to 17 feet, and a little to the southward of them is a black buoy (No. 7). This buoy lies $3\frac{1}{4}$ miles **SW. by W. $\frac{1}{4}$ W.** from Bishop and Clerks Lighthouse. The southeastern end of Horseshoe Shoal is marked by a red buoy (No. 12), lying $2\frac{3}{4}$ miles **E. $\frac{1}{2}$ S.** from Cross Rip Light-vessel.

Norton Shoal and Hawes Shoal extend from a point $1\frac{1}{4}$ miles to the eastward of Cape Poge to a point $5\frac{1}{4}$ miles **E. $\frac{1}{2}$ S.** from Cape Poge. Norton Shoal has a depth from 9 to 11 feet and is marked by two black buoys (Nos. 11 A and 11) near its northern edge. Hawes Shoal is triangular in shape and is lumpy and very irregular in depth (4 to 16 feet). It is marked at its **NW.** end by a buoy (black, No. 13) and at its **SW.** extremity by a buoy (red, No. 4).

Cape Poge Flats make off $\frac{1}{2}$ to 1 mile to the eastward, northeastward and northward from Cape Poge. Nearly $1\frac{1}{4}$ miles **NE.** from Cape Poge Lighthouse a black buoy (No. 15) is placed to guide clear of the flats.

Squash Meadow, with its northwestern end lying $1\frac{1}{4}$ miles **ESE.** from East Chop Lighthouse, extends a little over 1 mile in a **SE.** direction, is less than $\frac{1}{2}$ mile in width, has 5 to 13 feet of water over it, and is marked by two black buoys, one (No. 19) at its southeastern extremity and another (No. 21) at its northwestern extremity.

Hedge Fence is the shoal lying on the north side of the channel about 2 miles to the northeastward of East Chop Lighthouse. This shoal is $3\frac{1}{4}$ miles long in a **NW. by W. $\frac{1}{4}$ W.** and **SE. by E. $\frac{1}{4}$ E.** direction, is only about 300 yards wide, has a depth of 3 to 13 feet over it, and has 5 to 8 fathoms all around it. It is marked by two buoys (both red and black in horizontal stripes), one off its **NW.** and one off its **SE.** end. Between it and L'Hommedieu Shoal there is a passage with a depth of $8\frac{1}{2}$ to 11 fathoms and a least width of 1 mile.

3. *From Nobska Point Lighthouse through Vineyard Sound.*—Pass about 1 mile **S.** of Nobska Point Lighthouse and make good a **WSW. $\frac{1}{4}$ W.** course until Gay Head Lighthouse is abeam bearing **S. by E. $\frac{3}{4}$ E.**, then haul up and steer about west for Vineyard Sound Light-vessel. Leave this light-vessel on either hand and then with it over the stern:

If bound into Buzzards Bay, steer **N.** for Hen and Chickens Light-vessel and follow the directions for entering Buzzards Bay from the westward.

If bound into Sakonnet River, steer **NW.** by **W.** and be guided by the directions for that river.

If bound into Narragansett Bay, steer **WNW.** for Brenton Reef Light-vessel.

If bound through Block Island Sound to Long Island Sound, steer **W.**

If bound to sea, the **WSW. $\frac{1}{4}$ W.** course through Vineyard Sound continued for $31\frac{1}{2}$ miles after passing Gay Head Lighthouse will lead $3\frac{1}{4}$ miles **SE.** of Block Island (SE.) Lighthouse.

Remarks.—The **WSW. $\frac{1}{4}$ W.** course leads close to the southern shores of the Elizabeth Islands. Tarpaulin Cove Lighthouse will be seen on the starboard bow, and when past this lighthouse the course leads within $\frac{1}{4}$ mile of the shore of Naushon Island; there are no dangers, as the shore is bold-to and a depth of 5 to 9 fathoms will be found

300 yards from it. When nearing the western end of Naushon Island **Robinsons Hole**, a narrow passage leading between Naushon and Pasque islands into Buzzards Bay, and then the broader passage of **Quicks Hole** between Pasque and Nashawena islands, will be opened out. The black bell buoy at the southwestern side of the entrance to Quicks Hole will be left $\frac{1}{2}$ mile on the starboard hand. Gay Head Lighthouse will be seen on the port bow, and when abreast of Quicks Hole, in clear weather, Vineyard Sound Light-vessel may be seen on the starboard bow.

To avoid Lucas Shoal, keep in the northern half of the sound. *At night*, keep well to the northward of a line joining Nobska Point and Gay Head lights while between Tarpaulin Cove and Robinsons Hole.

Dangers.—**Middle Ground** is the name of a narrow shoal extending from a point nearly $\frac{1}{2}$ mile NW. from West Chop in a due W. direction for a distance of 2 miles. It has a uniform width of about 200 yards and a depth for the greater part from 2 to 6 feet, increasing at its western end to 9 and 17 feet. The depth surrounding the shoal is from 6 to 11 fathoms. A buoy (red and black horizontal stripes) lying $\frac{1}{2}$ mile NW. from West Chop Lighthouse marks the eastern end of the shoal.

Several small shoal spots with 14 to 16 feet over them lie in a W. by S. direction, and distant 1 to 2 miles from the western end of the Middle Ground. A buoy (red and black horizontal stripes) lying $2\frac{1}{2}$ miles SE. by E. $\frac{1}{2}$ E. from Tarpaulin Cove Lighthouse marks the westernmost of these spots.

Lucas Shoal is a narrow shoal with 14 to 16 feet of water over it lying $2\frac{1}{2}$ miles to the southward of Tarpaulin Cove Lighthouse and nearly in the middle of the sound. The shoal is about $\frac{1}{2}$ mile long in a general E NE. and W SW. direction and marked at its western end by a buoy (red and black horizontal stripes) which lies $2\frac{1}{2}$ miles S. $\frac{1}{2}$ W. from Tarpaulin Cove Lighthouse. About $\frac{1}{2}$ mile SW. by W. from this buoy are several detached spots with 18 feet over them.

Devil Bridge is a rocky ledge making out $\frac{1}{2}$ mile in a NW. direction from Gay Head; it has 2 feet over it about $\frac{1}{2}$ mile off shore and 17 feet at its outer edge. A buoy (black, No. 27) lies to the northwestward of the ledge and $1\frac{1}{2}$ miles NW. $\frac{1}{2}$ N. from Gay Head Lighthouse.

Sow and Pigs Reef is a rocky ledge extending $1\frac{1}{2}$ miles in a W SW. direction from Cuttyhunk. It is in part dry or awash at low water and has an average width of about 400 yards; at its outer end it has a depth of 15 feet and it is marked by a buoy (red, No. 2) $1\frac{1}{2}$ miles SW. by W. $\frac{1}{2}$ W. from Cuttyhunk Lighthouse.

SAILING DIRECTIONS, THROUGH NANTUCKET AND VINEYARD SOUNDS ALONG THE NORTH SHORE.

1. From Handkerchief Light-vessel to Succunnesset Shoal Light-vessel, Passing N. of Bishop and Clerks Lighthouse.—This passage is not safe for vessels drawing over 12 feet, as there are numerous shoal spots near Bishop and Clerks with 14 to 17 feet over them. Bring Handkerchief Light-vessel astern bearing SE. $\frac{1}{2}$ E. and steer NW. $\frac{1}{2}$ W. Pass about $\frac{3}{4}$ mile to the northeastward of Bishop and Clerks Lighthouse and about 300 yards to the southward of Hallets Rock buoy (red and black horizontal stripes), and when the old tower on Point Gammon bears N NE. distant about 1 mile, change the course to W SW. $\frac{1}{2}$ W. Make good this course (W SW. $\frac{1}{2}$ W.) for about $5\frac{1}{4}$ miles, and when Succunnesset Light-vessel bears W. $\frac{1}{2}$ S. steer for it, keeping it on that bearing. Pass the light-vessel close to on either hand and then proceed as directed in section 2.

If desiring to pass south of Bishop and Clerks Lighthouse, proceed as directed in section 1 A, following.

Remarks.—On the NW. $\frac{1}{2}$ W. course Bishop and Clerks Lighthouse will be nearly ahead, and the course leads across the eastern end of the shoal, with 15 to 16 feet of water over it, making out to the eastward from the lighthouse. Although more than 18 feet of water can be carried through the passage to the northward of Bishop and Clerks Lighthouse, it requires careful navigation and local knowledge, as there are numerous shoal spots with 14 to 17 feet over them.

On the W SW. $\frac{1}{2}$ W. course the bell buoy off Hyannis entrance will be left about $\frac{1}{2}$ mile on the starboard hand.

The W. $\frac{1}{2}$ S. course leads about $\frac{1}{2}$ mile to the northward of the buoy (black, No. 9) at the northwest end of Horseshoe Shoal, and fair between the buoy (red, No. 16) to the southward of Wreck Shoal and the buoy (black, No. 11) on the northern end of Eldridge Shoal.

Dangers.—**Bishop and Clerks** is the extensive shoal ground lying off the northern shore and extending from a point $1\frac{1}{2}$ to a point $3\frac{1}{2}$ miles to the southward of Point Gammon. The shoal is marked by Bishop and Clerks Lighthouse, which stands near its center. On an arm of the shoal extending nearly 1 mile to the southward from the lighthouse there are several rocks awash at low water, but that part of the shoal to the eastward, northward, and northwestward of the lighthouse has from 14 to 18 feet of water over it.

Hallets Rock, marked by a buoy (red and black horizontal stripes), is a small spot with 8 feet over it, lying $1\frac{1}{2}$ miles N. by W. $\frac{1}{2}$ W. from Bishop and Clerks Lighthouse.

Senator Shoal, marked at its southern edge by a buoy (red, No. 8), is the southern part of the shoal, making out over 1 mile to the southward and eastward from Point Gammon. Near the edge of this shoal and a little to the northwestward of the buoy there is only 7 feet of water.

Gasells Rock is the southernmost of a number of rocks extending to the southward from Point Gammon. It lies $\frac{1}{2}$ mile S. by E. $\frac{1}{2}$ E. from the old tower on Point Gammon, has 5 feet of water over it, and is marked by a buoy (red, No. 10).

Along the north shore, between Point Gammon and Succunnesset Point, shoals make out from 1 to $2\frac{1}{2}$ miles, but the sailing line leads well to the southward of them.

Horseshoe Shoal is described on page 73.

Wreck Shoal has 8 to 15 feet of water over it with $3\frac{1}{2}$ to 5 fathoms around it, is $\frac{1}{2}$ to $\frac{3}{4}$ mile wide and $1\frac{1}{2}$ miles long in an E. and W. direction. Its western end is only $\frac{1}{4}$ mile NE. $\frac{1}{2}$ E. from Succunneset Shoal Light-vessel. A buoy (red, No. 16) is on the southern edge of the shoal.

Eldridge Shoal, lying $\frac{1}{2}$ mile S. of Wreck Shoal, has 3 to 18 feet over it, is less than $\frac{1}{2}$ mile wide, and is about $\frac{1}{2}$ mile long in a NE. by E. and SW. by W. direction. On its northern side is a buoy (black, No. 11). The sailing line leads about midway between Wreck Shoal and Eldridge Shoal. Between the latter shoal and the western edge of Horseshoe Shoal there is a deep passage over 1 mile wide.

1 A. From Handkerchief Light-vessel to Succunneset Shoal Light-vessel, Passing S. of Bishop and Clerks.—Bring Handkerchief Light-vessel to bear SE. by E. $\frac{1}{2}$ E. and steer NW. by W. $\frac{1}{2}$ W. This course made good for 14 miles will lead about $1\frac{1}{2}$ miles to the southwestward of Bishop and Clerks Lighthouse and to a point 3 miles W. from it, and Succunneset Light-vessel should then bear W. $\frac{1}{2}$ S. Steer for Succunneset Light-vessel on that bearing, and when up to it pass it close-to on either hand and proceed as directed in section 2, following.

Remarks.—On the NW. by W. $\frac{1}{2}$ W. course Bishop and Clerks Lighthouse will be on the starboard bow, and will be left about $1\frac{1}{2}$ miles on the starboard hand. Bishop and Clerks buoy (red, No. 12) should be left 1 mile on the starboard hand. The least depth on the course should not be less than $3\frac{1}{2}$ fathoms. At night the red sector of Bishop and Clerks Light should be entered before Monomoy Point Light bears E. $\frac{1}{2}$ S. and it should not be brought to bear to the southward of E. $\frac{1}{4}$ S. while crossing the red sector of Bishop and Clerks Light.

The W. $\frac{1}{2}$ S. course leads about $\frac{1}{2}$ mile to the northward of the northern edge of Horseshoe Shoal. This shoal will be cleared if a vessel keeps to the northward of the line joining Bishop and Clerks Lighthouse and Succunneset Shoal Light-vessel.

West Chop Light, open a little to the southward of Succunneset Shoal Light-vessel will, insure the clearing of Wreck Shoal.

Dangers.—Bishop and Clerks are described on page 74.

Broken Ground, with 17 to 18 feet of water over it, lies 1 mile SW. from Bishop and Clerks Lighthouse, and a small shoal with 17 feet lies $1\frac{1}{2}$ miles WSW. from the same lighthouse.

Off the northeastern end of Horseshoe Shoal there are several shoal spots with 16 to 18 feet over them, but the sailing line leads more than $\frac{1}{2}$ mile to the northward of them.

Horseshoe Shoal is described on page 73; Wreck Shoal and Eldridge Shoal are described above.

2. From Succunneset Shoal Light-vessel to Nobska Point Lighthouse.—Having followed the directions in sections 1 or 1 A, bring Succunneset Shoal Light-vessel directly astern and steer W. $\frac{3}{4}$ N., leaving $\frac{1}{2}$ mile on the port hand the buoy (red and black horizontal stripes) marking a 9-foot spot lying $1\frac{3}{4}$ miles W. from the light-vessel, and passing $\frac{3}{4}$ mile to the northward of the western end of L'Hommedieu Shoal. When within less than 3 miles of Nobska Point Lighthouse steer about WSW. $\frac{1}{2}$ W. so as to pass about 1 mile to the southward of it, and then proceed as directed in section 3, page 73.

Remarks.—On the W. $\frac{3}{4}$ N. course Nobska Point Lighthouse will be on the port bow and Falmouth Heights on the starboard bow. The latter shows a steep sand cliff, the top of which is covered with houses, prominent among which is a brown-roofed conical tower which should bear N. $\frac{1}{2}$ W. when the course is changed to WSW. $\frac{1}{2}$ W.

The northern shore should be given a berth of $\frac{1}{2}$ miles, as shoals make out from it to nearly that distance.

Several black buoys will be left on the port hand when abreast of Falmouth Heights, and just to the eastward of Falmouth Heights a red buoy will be left about $\frac{3}{4}$ mile on the starboard hand. On the WSW. $\frac{1}{2}$ W. course Nobska Point Lighthouse will be left about 1 mile on the starboard hand, and the red bell buoy off Nobska Point will be left $\frac{1}{2}$ mile on the starboard hand.

Dangers.—Succunneset Shoal makes out to the southward from Succunneset Point in an E. by S. direction a distance of over 2 miles. It is about 2 miles long in an E. and W. direction, has an average width of about $\frac{1}{2}$ mile, and the depth over the greater part of it is from 3 to 5 feet. It is marked at its southeastern extremity by a buoy (red, No. 18) which is $\frac{3}{4}$ mile N. by E. from Succunneset Shoal Light-vessel. Between the light-vessel and buoy, and about 400 yards S. of the buoy, is a spot with 17 feet over it. A channel 500 yards wide and having a depth of 5 fathoms leads between Succunneset Shoal and Wreck Shoal.

Just to the southward of the sailing line is a 17-foot spot $\frac{1}{2}$ mile W. $\frac{1}{2}$ N. from Succunneset Shoal Light-vessel.

A 9-foot spot, mentioned in the sailing directions, lies $1\frac{3}{4}$ miles W. $\frac{1}{2}$ S. from Succunneset Shoal Light-vessel and is marked on its eastern side by a buoy (red and black horizontal stripes).

A 16-foot spot lies $1\frac{3}{4}$ miles W. by S. from Succunneset Shoal Light-vessel and about midway between the red and black horizontal striped buoy marking the 9-foot spot and the black buoy marking the eastern end of L'Hommedieu Shoal.

L'Hommedieu Shoal extends from a point 2 miles WSW. from Succunneset Shoal Light-vessel in a WNW. $\frac{1}{2}$ W. direction for a distance of $4\frac{1}{2}$ miles. It has an average width of about $\frac{3}{4}$ mile and a depth from 3 to 13 feet. A buoy (black, No. 13) marks its eastern end, and a buoy (black, No. 15) marks the shoal near its western end. The latter buoy is $2\frac{1}{4}$ miles NE. $\frac{1}{2}$ N. from West Chop Lighthouse.

A narrow shoal lying $2\frac{1}{4}$ miles E. $\frac{1}{2}$ S. from Nobska Point Lighthouse extends in an easterly direction $\frac{1}{2}$ mile. It has a depth of 12 to 15 feet and is marked at its eastern and western ends by buoys (black, No. 17 and No. 19).

CHATHAM ROADS—SAILING DIRECTIONS.

Shoals make out about $\frac{1}{2}$ mile from the northern shore from Succunnesset Point to the westward of Falmouth Heights, and 6 to 9 feet will be found $\frac{1}{2}$ mile off shore. Just to the eastward of Falmouth Heights is Davis Neck Shoal with 14 feet near its outer edge. A buoy (red, No. 20) lying $\frac{1}{2}$ mile SE. from the precipitous face at Falmouth Heights marks this shoal.

CHATHAM ROADS AND STAGE HARBOR.*

On the western side of Monomoy Island and Nauset Beach are extensive shoals, between which a channel leads to the northward to the deep water of the bight lying between Monomoy Island and the south shore of Cape Cod.

These shoals are marked at their southwestern end by Handkerchief Light-vessel and extend in a northerly direction to Stage Harbor Lighthouse, being in one place $2\frac{1}{2}$ miles from the shore.

About 3 miles to the westward of Stage Harbor Lighthouse, shoals extend to the southward from the south shore of Cape Cod, off Harwich Port, for a distance of $1\frac{1}{2}$ miles; between these and the shoals off the western side of Monomoy is Chatham Roads, a good anchorage with $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms water and good holding ground.

Stage Harbor is a small well sheltered anchorage used by fishermen and small local craft; it is entered through a narrow crooked channel which has a depth of 4 feet at low water and is marked by several buoys. The town of Chatham, on the northeastern side of the harbor, has no commerce except some vessels engaged in the fisheries and occasionally a cargo of coal is brought in small coasting vessels. It was formerly approached by water from the eastern side of Cape Cod, but the opening is now closed and the approach is from Stage Harbor.

Stage Harbor and Chatham Lighthouses (see table, page 12) are the guides for entering Chatham Roads and to the entrance of the buoyed channel into Stage Harbor. The western edge of Common Flat, the shoal on the eastern side of the roads, is marked by buoys.

Strangers should not attempt to enter Stage Harbor without a pilot on account of the sharp turns in the channel.

Tides.—The mean rise and fall of tides is 3.3 feet. Tides "Chatham Roads," page 22, is for east side Cape Cod.

SAILING DIRECTIONS TO THE ANCHORAGE IN CHATHAM ROADS.

The directions in section 1 A, and 1 B, are good for a draught of 18 feet. Vessels of 7 feet draught can be taken into Stage Harbor at high water, but it requires local knowledge. In heavy southwesterly gales when the anchorage is insecure for small craft, vessels of less than 12 feet draught can find shelter behind Common Flat.

The directions in section 1 should only be used by vessels of 10 feet or less draught in clear weather, when all the buoys can be seen. The tidal currents are very strong and at times draw down the buoys so as to leave but little of them out of water. Sailing vessels should not attempt it except with a strong favorable wind or with the tide.

1. Approaching and Entering from the Southward, Passing between Shovelful and Handkerchief Shoals.—Having entered by Pollock Rip Slue as directed in section 1, page 71, from Shovelful Shoal Light-vessel steer SW. by W. $\frac{1}{2}$ W. until red buoy No. 6 is broad off the starboard bow, then haul up for it; pass it close to on either hand and steer N NW. $\frac{1}{2}$ W., passing midway between red buoy No. 2, on the starboard hand, and red buoy No. 8, on the port hand and when the black buoy (No. 1) on the eastern edge of Handkerchief Shoal bears N. $\frac{1}{2}$ E. steer for it on that course; pass close to the eastward of it and continue the course until past the buoy (red and black horizontal stripes) on the southeastern end of Rodgers Shoal, and when Monomoy Point Lighthouse bears ESE. steer N NW. $\frac{1}{2}$ W. When Stage Harbor Lighthouse bears NE. by E. steer NE., leave Common Flat buoy (red, No. 4) $\frac{1}{4}$ mile on the starboard hand and anchor with Stage Harbor Lighthouse bearing between ENE. $\frac{1}{2}$ E. and E. by S. and distant $\frac{1}{2}$ to 2 miles.

To anchor behind Common Flat, steer for Stage Harbor Lighthouse in range with Chatham Lighthouses until up to the buoy (black and white perpendicular stripes) about $\frac{1}{4}$ mile from Stage Harbor Lighthouse; round this buoy, giving it a berth of about 200 yards on the starboard hand, and steer S. by E.; when a little past red buoy No. 6, anchor in 15 feet of water.

Remarks.—The channel between Handkerchief Shoal and Shovelful Shoal is less than $\frac{1}{2}$ mile wide at its narrowest part, but it is fairly well marked by buoys and has a depth varying from 10 feet to 11 fathoms.

On the N NW. $\frac{1}{2}$ W. course the houses of Harwich Port will be seen on the starboard bow; prominent among them a tall white church spire and a large brown building with a cupola. Stage Harbor Lighthouse and Chatham Lighthouses should be seen to the northeastward, although Chatham Lighthouses will be partly obscured by the trees on Stage Island, and may not be easily picked up in the daytime.

* Shown on chart 111, scale $\frac{1}{60,000}$, price \$0.50.

Dangers.—Shoelful Shoal is described on page 66, and Handkerchief Shoal on page 72.

Rodgers Shoal has 12 to 18 feet of water over it, is about $\frac{1}{2}$ mile long in a NE. and SW. direction, and less than $\frac{1}{2}$ mile wide, and is marked at each end by a buoy painted red and black in horizontal stripes. The southeastern end of the shoal lies $1\frac{1}{2}$ miles W. by N. from Monomoy Point Lighthouse. The channel between Handkerchief Shoal and Rodgers Shoal is about $\frac{1}{2}$ mile wide and has a least depth of $3\frac{1}{2}$ fathoms, and the channel between Rodgers Shoal and the shoal making to the westward from the southern end of Monomoy Island is $\frac{1}{2}$ mile wide and has a depth of 4 fathoms.

Shoals make out to a distance of 1 to 2 miles from the western shore of Monomoy Island, extending to Stage Harbor Lighthouse to the northward.

There is quite an extensive shoal with 12 to 17 feet over it, lying about 2 miles in a NW. direction from Monomoy Lighthouse. A buoy (red, No. 4) lies a little to the southeastward of the shoalest part of the shoal; this buoy should be left at least $\frac{1}{2}$ mile on the starboard hand when on a NNW. $\frac{1}{2}$ W. course, but vessels of 12 feet or less draught may stand to the northward on a N. by E. course, leaving the buoy $\frac{1}{2}$ mile on the port hand.

Common Flat, the name given to the shoal lying to the westward and northwestward of Shooters Island (the small island 4 miles N NE. $\frac{1}{2}$ E. from Monomoy Lighthouse), has a ruling depth of 3 to 5 feet and rises abruptly on its northern and western edges from 4 fathoms to 5 and 8 feet, but is well marked by buoys.

Harwich Flats is an extensive shoal, with 5 to 17 feet of water over it, making off $1\frac{1}{2}$ miles to the southward from the shore between South Harwich and Harwich Port. It is on the northwestern side of Chatham Roads and protects the anchorage in northwesterly winds.

1 A. *Approaching and Entering from the Southward or Southwestward.*—I. *Passing West of Handkerchief Shoal.*—Having followed the directions in section 1, page 71, or section 1 A, page 72, pass south of Handkerchief Light-vessel and bring it to bear E. distant about $\frac{1}{2}$ mile; then steer N. about $2\frac{1}{2}$ miles or until Monomoy Lighthouse bears E. by N. Then steer N NE. until Stage Harbor Lighthouse is in range with Chatham Lighthouses bearing E NE. $\frac{1}{2}$ E.

Steer for Stage Harbor Lighthouse, keeping it in range with Chatham Lighthouses, and when to the northward of red buoy No. 4, steer NE. by E. about 1 mile and anchor a little over $\frac{1}{2}$ mile from the beach in about 4 fathoms water, soft bottom.

II. *From Cross Rip Light-vessel.*—When close to the light-vessel, steer E. by S. about 3 miles, then steer NE. until Stage Harbor Lighthouse and Chatham Lighthouses are in range, then follow the directions in the preceding paragraph.

Remarks.—When standing on the N. course the western edge of Handkerchief Shoal will be left $\frac{1}{2}$ mile on the starboard hand. The shoal rises abruptly on this side and care should be taken not to be set to the eastward on to it.

On the N NE. course the black buoy, marking the NW. end of Handkerchief Shoal, should be left about $\frac{1}{2}$ mile on the starboard hand; the houses of South Harwich will be made a little on the starboard bow and Harwich Port (with very prominent tall white church spire) on the port bow. Stage Harbor Lighthouse should be made broad off the starboard bow and on the high land to the eastward of it the Chatham Lighthouses will be seen.

As soon as Stage Harbor Lighthouse and Chatham Lighthouses are in range they should be steered for; this will lead clear of all shoals and into Chatham Roads. To the southward and southwestward of Stage Harbor Lighthouse are several buoys marking the narrow channel from the roads into Stage Harbor.

Dangers.—The western edge of Handkerchief Shoal extends 4 miles in a general N. by E. direction from the light-vessel. This edge of the shoal has from 4 to 16 feet of water over it and is marked at its southern end, just north of the light-vessel, by a buoy (red, No. 10). The northwestern end of the shoal is marked by a buoy (black, No. 3).

The other shoals are described under section 1.

1 B. *Approaching and Entering from the Westward.*—Vessels of 12 feet or less draught can pass $\frac{1}{2}$ mile north of Bishop and Clerks Lighthouse and steer E. $\frac{1}{4}$ N. until Stage Harbor Lighthouse and Chatham Lighthouses are in range; then follow the range and proceed as directed in section 1A preceding.

Vessels of more than 12 feet draught should bring Bishop and Clerks Light to bear W. by N., distant $\frac{1}{2}$ mile, and steer E. by N., or if passing south of the lighthouse when it bears N., distant $1\frac{1}{2}$ miles, steer E NE. $\frac{1}{2}$ E. As soon as Stage Harbor and Chatham Lighthouses are made they should be brought in range and steered for. Anchor as directed under section 1.

Remarks.—The E. $\frac{1}{4}$ N. course passes about $\frac{1}{2}$ mile to the southward of the end of Kill Pond Bar and the buoy marking it. The northern shore should not be approached closer than $2\frac{1}{2}$ miles until standing on the range for entering the roads.

Dangers.—Kill Pond Bar has 4 to 7 feet of water over it and makes off from the shore to the eastward of Bass River Lighthouse; the end, marked by a buoy (spar, red, No. 6), is 3 miles SE. from the lighthouse and 2 miles S. from the wharves at Dennis Port.

Harwich Flats and Common Flat are described under section 1.

NANTUCKET HARBOR—GENERAL DIRECTIONS.

NANTUCKET HARBOR. *

This harbor lies on the northern shore of Nantucket Island, midway between its eastern and western ends. The entrance is between the western point of **Coatue Beach** on the E. and **Brant Point** on the W., and is $\frac{3}{4}$ mile wide, but the available channel is much contracted by Coatue Flats. Nantucket Harbor proper lies at the entrance to a large shallow lagoon of very irregular shape which runs in a nearly NE. direction about $4\frac{1}{2}$ miles, the head of the lagoon being separated from the ocean by a mere strip of sand, forming part of the eastern shore of Nantucket Island.

Coatue Point, the eastern point of entrance to the harbor, is a low, flat sand point, forming the western extremity of a long sand beach, dotted here and there with a few trees, called **Coatue Beach**, which extends in a nearly SW. direction from the northeastern shore of Nantucket Island for nearly 5 miles, and is in no place over $\frac{1}{4}$ mile wide. The lagoon or **Inner Harbor** is contained between this beach and the mainland of Nantucket Island.

Brant Point, the western point of entrance to the harbor, is a low, flat, sand point, extending out from the cliffs, and is easily recognized by **Brant Point Lighthouse**, which is built near its eastern end. The high perpendicular cliffs to the westward of it have a very remarkable appearance, and will enable any one to recognize the entrance to the harbor. When seen from the westward these cliffs hide all of the town, except the tops of some of the higher steeples; but seen from the northward, the thickly clustered houses will appear over the low land of Brant Point.

The town of Nantucket is built upon the western shore, at the entrance to the lagoon, just to the southward of Brant Point, and was in former times a place of considerable importance, owing to the number of vessels which fitted out here for the whale fishery. This branch of industry having failed, and the entrance being closed to any but vessels of light draught by numerous very dangerous shifting sand bars, the harbor is of but little commercial importance, and should never be resorted to by strangers. Vessels may, however, make a good anchorage in southerly gales outside the bar in from 4 to 7 fathoms, sticky bottom; but no vessel of over 6 feet draught should attempt to enter the harbor without a pilot. Only about 7 feet at low water can be taken across the bar at present. The present depth on the bar has been obtained by the building of two breakwaters under Government appropriations, and it is probable a greater depth will be obtained when the breakwaters are completed.

Near the foot of the cliffs, and bearing from Brant Point Lighthouse NW. by W. $\frac{1}{4}$ W. will be seen two small pyramidal wooden structures, called **Nantucket Cliff Range beacons** (see page 12).

Except in severe winters the harbor is seldom closed by local formations of ice, but is frequently closed by drift ice from the sound, which packs and remains across the entrance during northerly winds.

NANTUCKET HARBOR, GENERAL DIRECTIONS.

Approaching and Entering.—From Handkerchief Light-vessel steer S. by W. $\frac{3}{4}$ W.; or from Cross Rip Light-vessel steer SE. by E. $\frac{1}{2}$ E. for Nantucket Lighthouse until Brant Point Lighthouse bears S. by E., when steer for it on that bearing until nearly up to the entrance.

While well off the entrance get on the range of Nantucket Cliff beacons and stand in, keeping the range closely. Pass close to the bell buoy, leave red buoys (Nos. 2 and 4) on the starboard hand and black buoys (Nos. 1 and 3) on the port hand. When well past black buoy No. 3, haul a little more to the southward for black buoy No. 5, and from it follow the black buoys, leaving them close-to on the port hand. Give Brant Point a berth of from 50 to 150 yards and anchor in 11 to 17 feet of water, sticky bottom, with Brant Point Lighthouse bearing between NW. and N. by E. and distant 200 to 550 yards.

Remarks.—The approach to the harbor, between Great Point and the eastern end of Tuckernuck, is about 6 miles wide and clear of dangers. Vessels should keep at least $1\frac{1}{4}$ miles off shore until on the range of Nantucket Cliff beacons. The channel over the bar and into the harbor is liable to change and vessels must be guided by the buoys and range.

Dangers.—A detailed description of the dangers would be of no value; shoals make out over 1 mile from the shore line at Nantucket and to the eastward and westward of it; the edge of this shoal at the entrance to the harbor is well marked by buoys.

Tuckernuck Shoal is the shoal extending about $6\frac{1}{2}$ miles in a northeasterly direction from Muskeget Island. It has a depth over it varying from 4 to 18 feet, the ruling depth being 8 to 10 feet. The northeastern extremity of the shoal is marked by a buoy (black, No. 7) lying $6\frac{1}{2}$ miles WNW. $\frac{3}{4}$ W. from Nantucket Lighthouse; this buoy is a Nantucket Sound buoy and should be left on the starboard hand by vessels approaching Nantucket entrance. A bell buoy (black and white perpendicular stripes) lies on the northern side of Tuckernuck Shoal, $3\frac{1}{4}$ miles S. by E. from Cross Rip Light-vessel, and marks a point of the shoal where vessels drawing 9 feet or less may cross it.

* Shown on charts 243, scale $\frac{1}{10,000}$, price \$0.25; 111, scale $\frac{1}{50,000}$, price \$0.50.

HYANNIS HARBOR*

is a bight in the south shore of Cape Cod, about 15 miles to the westward of Chatham, which affords shelter from all but southerly winds. It is much used as a harbor of refuge by coasting vessels bound through Nantucket Sound, the smaller vessels, 14 feet or less draught, anchoring inside the breakwater, and are protected from all winds; vessels of over 14 feet draught anchor outside.

The harbor has been made a harbor of refuge by the building, under Government appropriations, of a breakwater 1,170 feet long, and by dredging to the northward of it. The area protected by the breakwater is about 175 acres, but much of it is very shallow, only a small part having been dredged to a depth of 15½ feet. The breakwater has been completed, and if the dredging contemplated is done there will be an anchorage area of about 40 acres with a depth of 15½ feet.

The entrance to the harbor lies 12 miles NW. from Handkerchief Light-vessel, and N NW. ¼ W. from Bishop and Clerks Lighthouse; it is somewhat obstructed by shoals, which are, however, well marked by buoys or spindles. Bishop and Clerks Light and Hyannis Light and range beacon are the principal guides for entering at night. The old tower on Point Gammon, the eastern point of the entrance, is a prominent mark in the daytime.

Lewis Bay is the large shallow body of water making to the northeastward from Hyannis Harbor; it is only used by small local craft, the entrance being obstructed by shoals.

The town of Hyannis is about 1 mile inland; Hyannis Port is at the head of the bight which forms Hyannis Harbor; it has a little trade and is a terminus of the Old Colony Railroad. The railroad wharf has a depth of 9 feet alongside it at low water and is a conspicuous mark when entering.

The entrance is approached from the eastward between Bishop and Clerks Lighthouse and Point Gammon, and from the westward by the main channel from Sueconnesset Shoal Light-vessel. The depth in the channel up to the breakwater is 16 feet.

Pilots are not generally taken, but a vessel desiring one should make signal when off the bell buoy at the entrance.

Supplies.—Coal and water may be obtained alongside the railroad wharf, provisions and ship chandler's stores at Hyannis.

Repairs.—Vineyard Haven is the nearest place at which repairs to hulls of vessels can be made, and New Bedford, Providence, or Boston for making repairs to the machinery of steamers.

Wind signals of the U. S. Weather Bureau are displayed at Hyannis (see Appendix I).

Ice seldom interferes with the movements of vessels, the prevailing northerly winds keeping the harbor clear (see ice, page 70).

Tidal data is given in the table on page 22.

SAILING DIRECTIONS, HYANNIS HARBOR.

The following directions are safe for vessels of 12 feet or less draught, and if accurately followed are good for vessels of 14 feet draught:

1. *Approaching and Entering from the Eastward.*—Pass about ¾ mile to the northeastward of Bishop and Clerks Lighthouse on a NW. course, and about 300 yards to the southward of the buoy on Hallets Rock.

When Hyannis Lighthouse and range beacon are in range bearing about N NE., steer for them until nearly up to the breakwater, then haul to the eastward and open the lighthouse about ¼ point to the eastward of the beacon, so as to leave the end of the breakwater about 100 yards on the port hand, and then haul more to the northward and anchor in 15½ feet of water, soft bottom, behind the breakwater.

Remarks.—Care should be taken not to approach Bishop and Clerks Lighthouse closer than ¾ mile while passing it, and after the light has been passed a sharp lookout should be kept for the buoy on Hallets Rock, which should be left 300 yards on the starboard hand. A black buoy should be made a little on the port bow and before it is reached Hyannis Light and the range beacon will be in range and the course changed.

Standing in for anchorage on the range, red buoy No. 2 will be left on the starboard hand, and the spindle on Great Rock, about ¼ mile on the starboard hand, and the spindle on the E. end of the breakwater will be a little on the port bow. The best anchorage for light draught vessels is behind the breakwater in 11 to 15 feet water. Vessels of 14 feet draught should anchor about 300 yards NE. by N. from the E. end of the breakwater.

Dangers.—Bishop and Clerks, Hallets Rock, Senator Shoal, and Gazelle Rock are described on page 74.

An extensive shoal ground, with numerous rocks, lies on the western side of the channel leading into Hyannis Harbor, between it and the channel, into Centerville Harbor. Off its eastern side this shoal ground is marked by a buoy (black, No. 1), which is a little to the westward of the range when standing in for the anchorage.

Gardiners Rock, a detached rock with 10 feet of water over it, lies ½ mile NW. by W. ¼ W. from the light-tower on Point Gammon; off its western side it is marked by a buoy (spar, red, No. 2).

* Shown in part on charts 111, 112, scale $\frac{1}{80,000}$, price of each, \$0.50.

HYANNIS HARBOR—SAILING DIRECTIONS.

Great Rock is a bare rock on the western edge of the flats which make to the westward from Point Gammon; it bears about NW. $\frac{1}{2}$ W., distant 1 mile from the old light-tower on Point Gammon, and is marked by a black spindle with cage on top.

1 A. Approaching and Entering from the Westward.—Passing close to the southward of Succunneset Shoal Light-vessel steer E. $\frac{1}{2}$ N. about $2\frac{1}{4}$ miles; then steer ENE. $\frac{1}{4}$ E. and pass at least 200 yards to the southward of the bell buoy off Hyannis entrance.

When a short distance past the bell buoy Hyannis Light and range beacon will be in range; steer for them and follow the directions in section 1 preceding.

Remarks.—On the E. $\frac{1}{2}$ N. course Eldridge Shoal buoy (black, No. 11) and Horseshoe Shoal (NW. end) buoy (black, No. 9) will be left well on the starboard hand and Wreck Shoal buoy (red, No. 16) on the port hand.

On the ENE. $\frac{1}{4}$ E. course Point Gammon will be on the port bow and Bishop and Clerks Light on the starboard bow. About the same time that the bell buoy is made a little on the port bow the buoys marking the dangers at the entrance to Centerville Harbor will be seen well to the northward of the sailing line. When up to the bell buoy Hyannis Light will bear about NNE. $\frac{1}{2}$ E.

Dangers.—Wreck Shoal, Eldridge Shoal, and Horseshoe Shoal are described on pages 73 and 75.

For dangers entering the harbor see under section 1 foregoing.

CENTERVILLE HARBOR.*

This harbor is a bight in the south shore of Cape Cod, to the westward of Hyannis Harbor; it is about 2 miles wide, just to the westward of Hyannis Point. The approach to the anchorage is obstructed by rocks and shoals, through which a buoyed channel, with a depth of 9 feet at low water, leads to the anchorage, which has a depth of 15 to 21 feet and good holding ground. Vessels seldom anchor here for shelter, as the harbor is exposed to southerly winds; the shoals off the entrance somewhat break the force of the seas from the southward, but not sufficiently to make it a safe anchorage. The deepest draught entering is about 12 feet; there is 7 feet at low water at the end of the wharf at the head of the harbor.

The village of Centerville is some distance inland from the head of the harbor, and is of little commercial importance. A church spire in the village is a prominent mark and is used as a guide for entering the harbor.

There are two channels that can be used by vessels entering, but the eastern is the better and is marked by buoys; strangers should not enter by the western channel.

Pilots are seldom taken to enter, but may be had by making signal while off the entrance.

Ice closes the harbor in winter.

Tides.—The mean rise and fall of tides is about 2.9 feet, corrected establishment, 12h. 20m.

SAILING DIRECTIONS, CENTERVILLE HARBOR.

These directions lead over a least depth of 9 feet. Strangers should not enter except in the daytime with clear weather and a fair wind.

1. Approaching and Entering from the Eastward.—Follow the directions in section 1, page 74, until Hallets Rock buoy (red and black horizontal stripes) bears N. distant about 400 yards; then steer W. $\frac{1}{2}$ N. about $2\frac{1}{4}$ miles until Centerville Church spire bears N. $\frac{1}{4}$ W. When the church spire bears N. $\frac{1}{4}$ W. steer for it on this bearing until a short distance past Channel Rock buoy (red and black horizontal stripes), then steer N. by W. $\frac{1}{2}$ W. and anchor about $\frac{1}{2}$ mile from the shore in 15 to 21 feet water, soft bottom.

Remarks.—See the remarks under section 1, page 74. On the W. $\frac{1}{2}$ N. course from Hallets Rock buoy the bell buoy off Hyannis Harbor entrance will be left about 400 yards and Hodges Rock buoy about $\frac{1}{2}$ mile on the starboard hand. The tall white church spire in Centerville will be the most conspicuous landmark to the westward of Hyannis.

When heading for the church spire the N. $\frac{1}{4}$ W. course leads to the eastward of black buoy No. 1, and about midway between red buoy No. 2, and the red and black horizontal striped buoy on Channel Rock. When a short distance to the northward of the latter buoy, the course should be changed to N. by W. $\frac{1}{4}$ W. On this course red buoy No. 4 is left on the starboard hand; after passing this buoy the course may be changed a little more to the northward, but keep to the westward of red buoy No. 6, which will be seen in the northern part of the harbor.

Dangers.—Hodges Rock has 6 feet of water over it and lies $2\frac{1}{4}$ miles WSW. $\frac{1}{4}$ W. from the old tower on Point Gammon; it is marked off its eastern side by a buoy (red and black horizontal stripes).

Colliers Ledge is awash at half tide and lies near the southern edge of the shoals making to the southward from the western side of Centerville Harbor; it is marked by a beacon (conical iron structure with red iron keg on top) which bears W. distant 4 miles from the old tower on Point Gammon.

Gallatin Rock is about 150 yards long in a general E. and W. direction and has a least depth of 4 feet over it. The rock lies $\frac{1}{2}$ mile E SE. $\frac{1}{4}$ E. from the beacon on Colliers Ledge and is marked off its southern side by a buoy (black, No. 1).

Channel Rock is a small detached rock with 4 feet of water over it and lies about $\frac{1}{2}$ mile E. $\frac{1}{4}$ N. from the beacon on Colliers Ledge; it is marked by a buoy (red and black horizontal stripes).

Bearses Rock, a small detached rock with 5 feet of water over it, lies on the eastern side of the channel about 700 yards to the eastward of Channel Rock; it is marked on its western side by a buoy (red, No. 2).

Gannet Rocks are a detached ledge showing bare at low water and lying $\frac{1}{2}$ mile W. by S. from Hyannis Point, the eastern point of the bight forming Centerville Harbor.

There are two rocks, **Middle Ledge** and **Dead Neck Rock**, with 6 feet of water over them, lying from $\frac{1}{2}$ to 1 mile about N. by E. from the beacon on Colliers Ledge. These are left well on the port hand when following the sailing directions.

1 A. *Approaching and Entering from the Westward.*—Follow the directions in section 1A, page 80, and having steered the E NE. $\frac{1}{4}$ E. course about 4 miles, the church steeple in Centerville should bear N. $\frac{1}{4}$ W. Steer for the steeple on this bearing and follow the directions in section 1 foregoing.

See the "remarks" and "dangers" under section 1A, page 80, and section 1 preceding.

COTUIT ANCHORAGE AND COTUIT BAY.*

Cotuit Anchorage, or **Deep Hole**, is a small anchorage with 8 to 10 feet of water between the shoals making off from the shore about $6\frac{1}{2}$ miles to the westward of Point Gammon. It is seldom used except by local craft, as it is exposed to southerly winds.

Cotuit Bay is a shallow body of water making in to the northward about 7 miles to the westward of Point Gammon, and to the northwestward of Cotuit Anchorage. It is used only by small local craft, the depth over the bar at the entrance being about $2\frac{1}{2}$ feet at low water. The village of **Cotuit Port** is on the western side of the bay, and the village of **Osterville** on the eastern side near its head. The channel to the anchorage is marked by several buoys, and vessels of less than 8 feet draught should not experience any difficulty in keeping in the best water. A stranger bound into Osterville Bay should anchor at Cotuit Anchorage and take a pilot. The buoy (red and black horizontal stripes, generally a bell buoy in summer) at the entrance to the channel bears WNW. $\frac{1}{4}$ W. nearly 7 miles from Bishop and Clerks Lighthouse, and NE. $\frac{1}{4}$ N. from Succunneset Shoal Light-vessel.

GENERAL DIRECTIONS APPROACHING AND ENTERING COTUIT ANCHORAGE.

The harbor is but little used and for the draught of vessels entering there are but few dangers in approaching.

In approaching from the eastward give the bell buoy off Hyannis entrance a berth of $\frac{1}{4}$ mile and steer WNW. $\frac{3}{4}$ W. This course will lead fair up to the entrance. Red buoy No. 2 will be a little on the starboard bow and the buoy (red and black horizontal stripes, bell buoy in summer) on Lone Rock will be a little on the port bow.

Leave red buoy No. 2 close-to on the starboard hand and steer NW. by W., pass midway between red buoy No. 4 and black buoy No. 1, and anchor in 10 feet close to the northward of them, or haul sharply to N. by E. $\frac{1}{4}$ E. and anchor in 7 to 12 feet when $\frac{1}{2}$ to $\frac{1}{4}$ mile from the shore.

If coming from the westward bring Succunneset Shoal Light-vessel astern while close to it and steer N. by E. $\frac{3}{4}$ E., leaving Succunneset Shoal buoy (red, No. 18) close-to on the port hand. When $\frac{1}{2}$ mile past the buoy steer NE. $\frac{1}{4}$ E. The bell buoy will be made a little on the port bow and red buoy No. 2 ahead. From this buoy enter as directed above.

FALMOUTH HARBOR.*

This name is applied to the open roadstead on the north shore of Vineyard Sound north of West Chop Lighthouse and about $2\frac{1}{2}$ miles east of Nobska Lighthouse. It is frequently used by large vessels with good ground tackle, who prefer the anchorage here to the one in Vineyard Haven on account of the crowded condition of the latter in bad weather. The anchorage in Falmouth Harbor affords a lee in northerly winds, and in heavy southerly gales the sea is somewhat broken by L'Hommedieu Shoal, so that vessels with good ground tackle can ride out a gale in comparative safety. The bottom is generally sticky and good holding ground, shoaling gradually towards the shore; the depth of water at the anchorage ranges from 3 to 6 fathoms.

* See footnote on page 80.

EDGARTOWN HARBOR—GENERAL INFORMATION.

Prominent features.—Nobska Point Lighthouse is the principal guide to the anchorage. A noticeable yellow bluff, **Falmouth Heights**, is just to the eastward of the village of Falmouth and about $2\frac{1}{2}$ miles ENE. from Nobska Point Lighthouse; this bluff, on which are numerous houses and a large hotel with large brown conical tower, is very prominent, especially in coming from the westward.

GENERAL DIRECTIONS FOR THE ANCHORAGE OFF FALMOUTH.

From the Eastward.—Following the directions in section 2, page 75, when on the W. $\frac{1}{4}$ N. course from Succonesset Shoal Light-vessel, continue this course until to the southward of Falmouth; then haul a little to the northward and anchor in 4 to $5\frac{1}{2}$ fathoms water, soft bottom, with Nobska Point Lighthouse bearing about WSW.

or, following the directions in section 2, page 73, when West Chop Lighthouse bears S., steer N. by W. and anchor in 4 to $5\frac{1}{2}$ fathoms water, with Nobska Point Lighthouse bearing about WSW.

From the Westward.—Standing through Vineyard Sound, when Nobska Point Lighthouse bears about N. by E., steer about NE., so as to leave the lighthouse at least $\frac{1}{4}$ mile on the port hand. Anchor when the lighthouse bears WSW. and is distant from $1\frac{1}{2}$ to 2 miles.

Remarks.—Light draught vessels can anchor closer to the shore in 15 to 17 feet water. **New Shoal**, which has 15 feet of water over it and lies to the westward of L'Hommedieu Shoal, is marked off its western end by black buoy, No. 19, which bears about E. $\frac{1}{4}$ S., distant $2\frac{1}{2}$ miles from Nobska Point Lighthouse. In approaching the shore heavy draught vessels should observe the bearing of Nobska Point Lighthouse, and at night they should anchor as soon as Nobska Point Light comes in range with Tarpaulin Cove Light.

EDGARTOWN HARBOR.*

This harbor is on the northern side of Marthas Vineyard just to the westward of Cape Poge; it is divided into the outer and inner harbors, the former being principally used as a harbor of refuge in southerly and easterly winds, and as an anchorage for the night. On the western side of the outer harbor are numerous rocks and shoals, which are well marked by buoys and a spindle; there is sufficient room to the eastward of these for a vessel to work to the anchorage. At the head of the outer harbor a narrow arm makes to the southward into Katama Bay, forming what is known as the inner harbor; this affords good anchorage in 3 to $5\frac{1}{2}$ fathoms, but the tidal currents are very strong and the bar south of Edgartown Lighthouse has only 15 feet of water over it. Strangers seldom enter the inner harbor, as a fair wind is necessary to keep in the channel.

Katama Bay is a large, shallow body of water only used by local fishermen; it has a shallow channel through which the fishing boats put to sea at high water with a smooth sea.

On the western shore of the inner harbor and a short distance to the westward of Edgartown Lighthouse, is the town of **Edgartown**, which has a little commerce and a daily steamer to New Bedford. Some of the wharves have 18 feet of water at their outer ends.

Aids to navigation.—Cape Poge Lighthouse is the principal guide for the entrance, and Edgartown Lighthouse for the anchorage and entering the inner harbor (see table of lights, pages 12-14). The principal dangers are marked by buoys or spindles and can easily be avoided.

The channel is free from dangers and has a least width of $\frac{1}{2}$ mile and depth of 4 to 6 fathoms until nearly up to Edgartown Lighthouse; here it narrows and takes a sharp bend to the westward, with a depth of 15 feet, leading to the wharves of the town. Abreast the town the channel is narrow and has a depth of 4 to 6 fathoms; it then curves to the southward, its eastern edge marked by black buoys, until about $\frac{1}{4}$ mile above the upper wharf in the town, where it widens and has a depth of $3\frac{1}{2}$ to 5 fathoms; this depth continues for $1\frac{1}{2}$ miles into Katama Bay, where it gradually shoals.

Anchorage.—In easterly gales good shelter is found to the westward of Cape Poge on the eastern side of the outer harbor. In westerly and southerly gales vessels find shelter in the southern end of the outer harbor with Edgartown Lighthouse bearing between W. and NW., distant about $\frac{1}{2}$ mile. Vessels should not anchor in the channel abreast the town, where the bottom is hard sand, the channel narrow, and tidal currents strong. Above the town, anchorage is found in the channel in $3\frac{1}{2}$ to 5 fathoms of water, with sticky bottom.

Pilots are not required for the outer harbor; a stranger of over 12 feet draught should take a pilot if bound into the inner harbor. Pilots will come out to a vessel making signal for one in the outer harbor.

Towboats are not used. A towboat is usually stationed at Vineyard Haven or Woods Hole in the winter and can be sent for by telephone from Edgartown.

Supplies.—Coal, in limited quantity, and water can be obtained alongside the wharves. Provisions and ship chandler's stores can be had in the town.

* Shown on charts 346, scale $\frac{1}{20,000}$, price \$0.25; 112, scale $\frac{1}{20,000}$, price \$0.50.

Currents.—The tidal currents in the narrow part of the channel, inside Edgartown Lighthouse and off the town, are strong, but as a rule follow the direction of the channel. When the current turns from E. to W. in the sound off Edgartown, the southerly current is at its strength in the harbor.

Tidal data is given in the table on page 22.

Ice.—Drift ice from the sound, driven into the entrance by the wind, obstructs the entrance of sailing vessels during a part of the winter. The strong tidal currents keep the inner harbor open except for a few days at a time during severe winters.

SAILING DIRECTIONS, EDGARTOWN HARBOR.

The following directions if closely followed are good for a vessel of 20 feet draught to the anchorage to the eastward of Edgartown Lighthouse, or for a vessel of 14 feet draught to the town wharves.

1. Approaching and Entering from the Eastward.—Stand to the westward on a **W NW. $\frac{3}{4}$ W.** course from Cross Rip Light-vessel until Cape Poge Lighthouse bears **SW.**, then change the course to **W SW.**, and when Cape Poge Lighthouse bears **SE. $\frac{1}{2}$ S.** steer **SSW. $\frac{3}{4}$ W.**, with Edgartown Lighthouse a little on the starboard bow. Anchor in 23 to 31 feet of water with Edgartown Lighthouse bearing between **W.** and **NW.** and distant not more than $\frac{1}{2}$ nor less than $\frac{1}{4}$ mile.

If of 14 feet or less draught.—When the buoy (red, No. 10) lying about 350 yards **SE.** by **E.** from the lighthouse is made, haul a little to the westward and pass it close-to on a **W NW. $\frac{1}{4}$ W.** course. Continue this course up to the wharves, hauling gradually to the westward and southward.

Remarks.—The **W SW.** course leads well clear of the shoals, making out to the northward from Cape Poge.

On the **SSW. $\frac{3}{4}$ W.** course the buoy (black, No. 1) to the westward of Cape Poge will be left $\frac{1}{4}$ mile on the port hand, and a number of red buoys will be seen on the western side of the harbor; Edgartown Lighthouse will be a little on the starboard bow, and farther to the right the houses of Edgartown will be seen.

On the **W NW. $\frac{1}{4}$ W.** course red buoy No. 10 will be left close-to, and the lighthouse about 150 yards on the starboard hand.

Dangers.—Cape Poge Flats extend $1\frac{1}{2}$ miles to the northeastward from Cape Poge and are marked near their outer end by a buoy (black, No. 15), which lies about **NE.** from the lighthouse. Vessels of 14 feet draught or more, should pass to the northward of the buoy; those of less draught can pass to the southward of it, but should give Cape Poge a berth of at least $\frac{1}{4}$ mile.

Shoal water extends nearly $\frac{1}{4}$ mile to the northwestward of Cape Poge, but its western edge is marked by a buoy (black, No. 1) in 21 feet of water.

Sturgeon Flats, with 8 to 15 feet of water over them, make off about 600 yards from the eastern shore of the outer harbor to the southward of the narrow entrance to Cape Poge Bay. The western edge of the flats are marked by a buoy (black, No. 3), from which the edge of the flats extend in a general **SW. $\frac{3}{4}$ W.** direction to the head of the outer harbor.

On the western side of the harbor is a shoal which extends $2\frac{1}{2}$ miles in a **NNE.** direction from Edgartown Lighthouse and the shore just to the westward of the lighthouse. The northern extremity of this shoal lies about 2 miles **NW. $\frac{1}{4}$ W.** from Cape Poge Lighthouse and is marked by a buoy (black, No. 17) which is left on the starboard hand by vessels entering the harbor. Just inside of this buoy is a spot with only 11 feet over it, but there is deeper water a little farther to the southward. The depth on this shoal is very irregular, and there are a number of rocks with from 3 to 5 feet of water over them. **Allen Rock**, the farthest off shore, lies **W NW. $\frac{3}{4}$ W.** from Cape Poge Lighthouse and 2 miles **NNE.** from Edgartown Lighthouse, has 4 feet of water over it, and is marked by a buoy (red, No. 2). **Hatsett Rock**, **Monohansett Rock**, and **Mill Rock**, lying $\frac{3}{4}$ to $\frac{1}{2}$ mile in a general southerly direction from **Allen Rock**, are others of the rocks on this shoal which lie well off shore and which are marked by buoys. Light draught steamers running between Edgartown, Cottage City, and points to the westward, cross this shoal, but strangers should not do so.

1 A. Approaching and Entering from the Westward.—**I. Passing N. of Squash Meadow,** make good the course **SE. by E. $\frac{3}{4}$ E.** with Nobska Point Lighthouse bearing directly astern until Cape Poge Lighthouse bears **S SE. $\frac{1}{2}$ E.**, when steer for it on that bearing. When within about 2 miles of Cape Poge Lighthouse, and Edgartown Lighthouse bears **S SW. $\frac{3}{4}$ W.**, steer **S SW.** Anchor when abreast and to the eastward of the lighthouse, as described in section 1.

If desiring to enter the inner harbor proceed as directed under section 1, foregoing.

Remarks.—The **SE. by E. $\frac{3}{4}$ E.** course leads in a nearly parallel direction and about $\frac{1}{4}$ mile S. of Hedge Fence, and the buoy (red and black horizontal stripes) on its western end will be left about $\frac{1}{4}$ mile on the port hand. When nearing the turn from the **S SE. $\frac{1}{2}$ E.** to the **S SW.** course into the harbor, two 18-foot spots will be left nearly $\frac{1}{4}$ mile on the port hand.

On the **S SW.** course into the harbor, the buoys marking **Allen Rock**, **Hatsett Rock**, **Monohansett Rock**, and **Mill Rock** will be left well on the starboard hand, and the buoy (red, No. 10) off Edgartown Lighthouse will be made a little on the starboard bow.

Dangers.—Hedge Fence and Squash Meadow are described on page 73.

Off the entrance are two 18-foot spots, one $1\frac{1}{2}$ miles the other $2\frac{1}{2}$ miles N. by W. $\frac{1}{2}$ W. from Cape Poge Lighthouse. See also dangers under section 1.

II. Passing S. of Squash Meadow. When about $\frac{3}{4}$ mile N. of East Chop Lighthouse bring Cape Poge Lighthouse to bear SE. and steer for it. Leave the buoy (black, No. 21), marking the western end of Squash Meadow, about 300 yards on the port hand, and when Edgartown Lighthouse bears SW. by S. steer S SW. Anchor when abreast and to the eastward of the lighthouse.

Remarks.—The SE. course for Cape Poge Lighthouse leads close to the northward of the buoy (black, No. 23) off East Chop Flats, and nearly parallel to and about $\frac{1}{2}$ mile to the southward of Squash Meadow, the western and eastern ends of which are marked by black buoys, Nos. 21 and 19 respectively.

After passing East Chop the houses and two landings at Cottage City will be seen. When nearly up to the entrance of the harbor the buoy (black, No. 17) will be made and it should be left on the starboard hand; it is a channel buoy for the sound and not a harbor buoy.

Dangers.—Squash Meadow is described on page 73; for other dangers see under section 1 preceding.

VINEYARD HAVEN.*

This harbor is a funnel-shaped bight about $1\frac{1}{2}$ miles long in a NE. and SW. direction and about $1\frac{1}{2}$ miles wide at the entrance; it is on the northern side of Marthas Vineyard, $12\frac{1}{2}$ miles WNW. $\frac{1}{2}$ W. from Cross Rip Light-vessel, $6\frac{1}{2}$ miles NW. from Cape Poge, and $3\frac{1}{2}$ miles SE. from Nobska Point Lighthouse.

The points at the entrance are East Chop and West Chop, each marked by a lighthouse (see table, page 14). The harbor is easy of access and is the most important and generally used harbor of refuge for coasters between Provincetown and Narragansett Bay; it is exposed to northeasterly winds, but vessels with good ground tackle can ride out any gale. The greatest danger encountered by vessels at anchor in a northeast gale is from vessels with poor ground tackle which are likely to drift and foul other vessels and then go ashore. About 8,000 vessels anchor here for shelter every year, and it is not uncommon to see 200 vessels of various sizes at anchor at one time. The depth is sufficient for the largest vessels passing through Vineyard Sound; it ranges from 35 feet at the entrance to 15 feet near the head of the harbor. On the west shore near the head of the harbor is the town of Vineyard Haven, which has a little trade and daily communication by steamer with New Bedford. There is 13 feet of water alongside the wharf at low water. On the east shore are numerous scattered houses and a wharf having 17 feet of water at its end at low water. A road leads from this wharf to Cottage City, which is an important summer resort.

The channel is unobstructed and the lead will be the best guide in selecting an anchorage. When well inside the entrance the water shoals gradually toward the western shore; toward the eastern shore the water shoals more abruptly and the shore should be given a berth of about 300 yards.

Anchorage.—Vessels anchor, according to draught, anywhere from the points at the entrance to the head of the harbor, the light draught vessels favoring the western shore.

Pilots.—Coasting vessels do not take a pilot to enter the harbor, as the anchorage can be made without difficulty. Pilotage is compulsory for foreign vessels entering to discharge cargo. Pilots for Vineyard and Nantucket sounds can be obtained at Vineyard Haven.

Towboats.—A towboat will usually be found here in the winter.

Supplies.—Coal, in limited quantity, and fresh water can be obtained alongside the wharf for steamers of 15 feet draught or less; steamer of greater draught can have coal brought alongside in lighters. Provisions and ship chandler's stores can be had at Vineyard Haven.

Repairs.—There is one marine railway at Vineyard Haven, capacity about 400 tons, where vessels can be repaired. New Bedford is the nearest place at which repairs to the machinery of steamers can be made.

Wind signals of the U. S. Weather Bureau are displayed from a staff on the hotel on Main street.

There is a U. S. Marine Hospital here to which seamen entitled to hospital treatment are sent. For regulations of the U. S. Marine Hospital Service see Appendix III.

Currents.—The tidal currents are not strong in the harbor; care should however be taken on the ebb, which sets to the westward, not to approach too closely to West Chop, as the current there sets on the ledges which make to the eastward and northward from the point.

Tidal data is given in the table on page 22.

Ice.—Both local and drift ice obstruct the movements of vessels in severe winters and at times entirely close the harbor. Strong northerly winds drive drift ice from Vineyard Sound into the harbor and endanger vessels at anchor.

* Shown on charts 347, scale $\frac{1}{10,000}$, price \$0.25; 112, scale $\frac{1}{80,000}$, price \$0.50.

SAILING DIRECTIONS, VINEYARD HAVEN.

Note.—The currents turn about $\frac{1}{2}$ hour earlier inshore across the entrance of the harbor than in the channel through the Sound. Vessels entering the harbor, with a head wind or light breeze at the end of a favorable current through the sound, should stand on in the channel until the harbor is well opened before standing in for the anchorage, so as to clear the points at the entrance.

1. *Approaching and Entering from the Eastward.*—Steer for West Chop Lighthouse on a **W NW. $\frac{3}{4}$ W.** bearing until East Chop Lighthouse bears **S.**, then steer **SW. $\frac{3}{4}$ W.** directly into the harbor. Anchor according to draught.

Remarks.—On the **SW. $\frac{3}{4}$ W.** course the eastern shore will be given a berth of 400 to 500 yards until the head of the harbor is approached. Two wharves making out from the eastern shore will be passed and a buoy (black, No. 1) will be left about 150 yards on the port hand, and red buoy No. 4, near the southern end of the harbor, will be a little on the starboard bow. There is excellent anchorage in 20 to 23 feet of water a little to the eastward of this buoy.

Dangers.—Hedge Fence and Squash Meadow to the northeastward and eastward of the entrance are described on page 73.

East Chop Flats have 8 to 18 feet of water over them and extend a little over $\frac{1}{2}$ mile in a northeasterly direction from East Chop, and are marked off their northeastern end by a buoy (black, No. 23).

Canal Flats, with 3 feet of water over them, make off 300 yards from the eastern shore of the harbor, about 1 mile inside of East Chop Lighthouse; their northwestern edge is marked by a buoy (black, No. 1).

1 A. *Approaching and Entering from the Westward.*—Passing Tarpaulin Cove Lighthouse, bring it to bear **W. $\frac{1}{4}$ S.** astern and steer **E. $\frac{1}{4}$ N.** When East Chop Lighthouse bears **SE.** by **S.**, steer for it until West Chop Lighthouse bears **W.** by **N.**, then steer **SW.** by **S.** for the anchorage and anchor as directed in section 1, foregoing.

Remarks.—The **E. $\frac{1}{4}$ N.** course leads well to the northward of the Middle Ground. When West Chop Lighthouse bears about **SE. $\frac{1}{4}$ E.** East Chop Lighthouse will open from behind it. On the **SE.** by **S.** course the buoys marking the shoals off West Chop will be left about $\frac{1}{2}$ mile on the starboard hand.

On the **SW.** by **S.** course the wharf on the eastern side of the southern part of the harbor and the Marine Hospital buildings farther back (and quite prominent) will be directly ahead.

See the note preceding section 1.

Dangers.—The *Middle Ground* to the westward of West Chop is described on page 74.

Shoals make off $\frac{1}{2}$ mile to the northward and eastward from West Chop; the edge of these shoals is marked by two buoys. West Chop buoy (black, No. 25) is colored and numbered for the channel through Vineyard Sound; Low Point Flats buoy (red, No. 2) is a guide for entering the harbor.

Alleghany Rock, with 6 feet of water over it, lies about 650 yards **N. $\frac{1}{4}$ E.** from West Chop Lighthouse, near the edge of the shoals. A rock, awash at low water, lies $\frac{1}{2}$ mile **SE. $\frac{1}{4}$ E.** from West Chop Lighthouse, near the eastern edge of the shoals, and several sunken rocks and rocks awash at low water lie inshore of it.

See also dangers under section 1, foregoing.

WOODS HOLL.*

This is a narrow passage, between the mainland and the easternmost of the Elizabeth Islands, leading from Vineyard Sound into Buzzards Bay; on its northern side are two coves known respectively as Little Harbor and Great Harbor. Woods Holl is little used as an anchorage on account of the strong tidal currents and the difficulty of entering or leaving except with a fair wind. The entrance from Vineyard Sound is to the westward of Nobska Point, between it and Nomanasset Island, and is about $\frac{1}{2}$ mile wide; the whole of this width is not available as an entrance for vessels, as numerous rocks and shoals make out from both shores and lie in the middle of the entrance, leaving two narrow buoyed channels. The passage through into Buzzards Bay is very narrow and has a depth of 10 feet. Although it is well marked by buoys the tidal currents are so strong as to make even the passage of steamers dangerous without some local knowledge; the buoys in the narrowest parts of the channel are frequently dragged under by the currents at strength. A stranger should not attempt to pass through without a pilot.

Little Harbor is the easternmost of the two coves in the north shore of the passage; it has a small anchorage with 9 to 12 feet water. A channel 130 feet wide and 10 feet deep was dredged to the anchorage and to the wharf of the lighthouse depot, which is on the western side of the cove, but the best depth at present (1893) is about 9 feet at low water. The village of Woods Holl is at the head of the cove and along the eastern shore of Great Harbor.

* Shown on charts 348, scale $\frac{1}{5,000}$, price \$0.50; 113, scale $\frac{1}{80,000}$, price \$0.50.

WOODS HOLL—GENERAL INFORMATION.

Great Harbor is about $\frac{1}{2}$ mile long NW. and SE., and nearly $\frac{1}{2}$ mile wide; its depth is irregular, ranging from $3\frac{1}{2}$ to 12 fathoms in the channel, and the holding ground is mostly poor. On the eastern side of the harbor is the wharf and depot of the Old Colony Railroad, and above this is the wharf, basin, and large buildings of the U. S. Fish Commission, which are prominent when entering from the southward. On the north shore is the wharf and large red buildings of the Pacific Guano Company, at which vessels of 2,000 tons can load.

Wind signals of the U. S. Weather Bureau are shown from the U. S. Fish Commission building. They are also displayed on Nobska Point, near the lighthouse.

Tidal data is given in the table on page 22.

Currents.—The currents in the passage through Woods Holl have a greatest velocity of 5 knots during neap and 8 knots during spring tides and are somewhat influenced by the wind. Slack water is of short duration, and the current from Vineyard Sound in to Buzzards Bay (west current) begins to run about 45 minutes before high water at Boston. The average duration of the west current is $5^h 53^m$ and of the east current $6^h 32^m$. These times are subject to a variation of as much as 1 hour due principally to the wind.

In the upper part of Great Harbor, near the Fish Commission wharf, the currents are barely perceptible and vessels at anchor always head to the wind.

The mean rise and fall of tides in the passage is $2\frac{1}{2}$ feet.

Ice.—The strong tidal currents usually keep the harbor open. Drift ice is brought through from Buzzards Bay, but seldom interferes with navigation, except in unusually severe winters, when it may close the entrance from that bay.

SAILING DIRECTIONS, WOODS HOLL TO AN ANCHORAGE IN GREAT HARBOR.

The directions in sections 1 and 1A, if closely followed, will carry a least depth of 3 fathoms at low water; this depth will be found between the buoys on Great Ledge and Nonamesset Shoal, at the entrance to Great Harbor. Strangers should not attempt to enter except in the daytime, with clear weather.

1. Approaching and Entering from the Eastward.—Steer so as to pass at least $\frac{1}{2}$ mile to the southward of Nobska Point Lighthouse, and then steer W. until Woods Holl is opened.

When the cupola of the Fish Commission building bears N., steer for it and keep it on that bearing. The black buoy No. 1, at the entrance, will be left about 120 yards on the port hand, the red buoy No. 2 about the same distance on the starboard hand, red buoy No. 4 about 240 yards, and red buoy No. 6 about 50 yards, on the starboard hand.

When red buoy, No. 6, is on the quarter steer about N NW. $\frac{1}{2}$ W. for the wharf of the Guano Works. Anchor to the northwestward of the Fish Commission wharf, in 4 to 7 fathoms, taking care to keep to the southward of a line drawn from the end of the northern Fish Commission pier to the end of the Guano Works wharf.

Vessels of 8 feet or less draught may pass 250 yards south of Nobska Point, and steer NW. by W. $\frac{1}{2}$ W., so as to pass about 200 yards south of Parkers Neck, leaving Coffin Rock and Great Ledge buoys well on the port hand and red buoy No. 4, off Parkers Neck, about 50 yards on the starboard hand. When the end of the railroad wharf shows well clear of the western shore of Parkers Neck, steer N. by W. $\frac{1}{2}$ W., heading so as to leave red buoy No. 6 about 50 yards on the starboard hand and to clear the end of the Fish Commission wharf. Then follow the directions in the preceding paragraph.

Remarks.—Passing south of Nobska Point, the bell buoy to the southward of the point can be left on either hand. When to the westward of the point a lookout should be kept for the black buoy on the western side of the entrance, and the red buoy to the eastward of it. When between these buoys and steering N. for the Fish Commission building, the Old Colony Railroad wharf will be on the starboard bow and red buoy No. 6 will be made a little on the starboard bow. On the port bow several buoys and a spindle, marking the two channels of the passage into Buzzards Bay, will be seen. The current from Buzzards Bay has a tendency to set vessels to the eastward.

On the N NW. $\frac{1}{2}$ W. course black buoy No. 3 is left on the port hand. Care must be taken to give the end of the Fish Commission wharf a good berth when the current is running to the eastward through the passage, as it is likely to set a vessel on to the end of the wharf. There is very little current to the northward and northwestward of the wharf, and vessels at the anchorage usually swing with the wind.

Dangers.—Ledges, showing partly bare at low water, make out 150 yards to the southward and southwestward from Nobska Point.

Coffin Rock a small detached rock with 5 $\frac{1}{2}$ feet water over it, lies $\frac{1}{2}$ mile W SW. from Nobska Point Lighthouse and is marked off its southeastern side by a buoy (black, No. 1).

Great Ledge, with 1 $\frac{1}{2}$ feet water over it, is about 175 yards in diameter and lies nearly $\frac{1}{2}$ mile W. $\frac{1}{2}$ S. from Nobska Point Lighthouse. It is marked off its southwestern end by a buoy (red, No. 2).

There is a small spot, with 11 feet water over it, about 180 yards SW. by S. from the buoy on Coffin Rock.

Nonamesset Shoal has depths of 10 to 16 feet over it and makes out $\frac{1}{2}$ mile to the eastward from the island on the western side of the entrance to Great Harbor. The eastern edge of the shoal is marked by a buoy (black, No. 1) near its southern end.

Parkers Flats make off 175 yards from the shore to the southward of the Old Colony Railroad wharf and are marked off their western edge by a buoy (red, No. 6).

Red Ledge and Grassy Island lie on the western side of the harbor opposite Parkers Flats. The passage known as "Lone Rock Passage" leads between these dangers and is marked by a spindle and two buoys. The northern end of the ledges surrounding Grassy Island is marked by a buoy (black, No. 3). The channel to the anchorage in Great Harbor leads between this buoy and the end of the Fish Commission wharf.

The northwestern end of the harbor is shoal, with depths of 5 to 9 feet.

1 A. *Approaching and Entering from the Westward.*—When abreast of Tarpaulin Cove Lighthouse, steer for Nobska Point Lighthouse, course about NE. by E. $\frac{1}{2}$ E. When about 1 mile distant from Nobska Point Lighthouse watch the bearing of the cupola on the Fish Commission building and when it bears N. steer for it, passing midway between black buoy No. 1 and red buoy No. 2. Leave red buoy No. 6, which should be made on the starboard bow, about 50 yards on the starboard hand and proceed as directed in section 1, foregoing.

Remarks.—When standing for Nobska Point Lighthouse there are no dangers to look out for until up to Nonamesset Shoal.

See the "remarks and dangers" under section 1, foregoing.

TARPAULIN COVE*

is a small bight in the south shore of Naushon Island, about 5 miles W SW. $\frac{1}{2}$ W. from Nobska Point Lighthouse; it affords shelter from northerly and northwesterly winds and is frequently used as an anchorage by vessels headed off by the wind or meeting a strong head tide, or as an anchorage for the night when passing through Vineyard Sound. The depth at the entrance is about 5 fathoms, and inside it is 15 to 18 feet, decreasing gradually toward the head of the cove; the bottom is good holding ground. The western point at the entrance is marked by Tarpaulin Cove Lighthouse (see table, page 14) and two buoys are placed to guide clear of rocks near the western shore of the cove.

Wind signals of the U. S. Weather Bureau are displayed at Tarpaulin Cove; for explanation of their meaning see Appendix II.

SAILING DIRECTIONS TO AN ANCHORAGE IN TARPAULIN COVE.

Good anchorage in 14 feet water can be found in the cove with Tarpaulin Cove Lighthouse bearing to the southward of SW. Heavy draught vessels should anchor with the lighthouse bearing to the westward of SW.

1. *Approaching and Entering from the Eastward.*—When passing West Chop give it a berth of $\frac{3}{4}$ mile or more and steer about W. As soon as Tarpaulin Cove Lighthouse is made steer for it, keeping it bearing to the southward of W. so as to clear the Middle Ground and give the northern shore of the sound a berth of at least $\frac{1}{4}$ mile. When a little more than $\frac{1}{2}$ mile distant from Tarpaulin Cove Lighthouse haul a little to the northward and anchor according to draught, giving the shores a berths of at least 250 yards.

Dangers.—Both shores should be given a berth of at least 150 yards when entering, as rocks and bowlders lie nearly that distance from shore.

A rock, with only 1 foot over it at low water and 7 to 9 feet around it, lies 300 yards NE. $\frac{1}{2}$ N. from Tarpaulin Cove Lighthouse, and about 80 yards from shore.

A rock, with 7 $\frac{1}{2}$ feet over it at low water in a surrounding depth of 12 to 13 feet, lies 650 yards N. $\frac{1}{2}$ E. from Tarpaulin Cove Lighthouse.

1 A. *Approaching and Entering from the Westward.*—Stand to the eastward keeping Gay Head Lighthouse bearing to the southward of SW. to clear Lucas Shoal, and give the northern shore of the sound a berth of $\frac{3}{4}$ mile until past Robinsons Hole. When Tarpaulin Cove Lighthouse is made, steer so as to give the shore to the southward and eastward of it a berth of at least $\frac{1}{4}$ mile, and then haul to the northward; stand in and anchor according to draught.

At night vessels should steer NE. by E. $\frac{1}{2}$ E. for Nobska Point Light, until Tarpaulin Cove Light is made.

Remarks.—Tarpaulin Cove Light is shut in by the trees to the southwestward of it, and cannot be seen at night until it bears about NE.

*See footnote page 80.

QUICKS HOLE—SAILING DIRECTIONS.

ROBINSONS HOLE AND QUICKS HOLE.*

Robinsons Hole is a narrow passage from Vineyard Sound to Buzzards Bay, leading between Naushon Island and Pasque Island; the southern entrance lies $2\frac{1}{2}$ miles to the westward of Tarpaulin Cove. This passage is buoyed and deep, but is narrow, full of rocks and ledges, has strong tidal currents, and should never be attempted by a stranger; local fishermen sometimes pass through it.

Quicks Hole, leading between Pasque and Nashawena islands from Vineyard Sound into Buzzards Bay, is the only one available for a stranger to the eastward of Cuttyhunk. It lies about 4 miles to the westward of Tarpaulin Cove and is about $\frac{1}{2}$ mile wide with a clearly defined entrance which bears N. $\frac{1}{2}$ E. from Gay Head Lighthouse. The channel is nearly straight, has a width of 700 yards, a least depth of $3\frac{1}{2}$ fathoms, and is marked by buoys. The tidal currents are strong and a vessel should not attempt to pass through unless with a strong favorable wind or a favorable current. When the current is setting to the westward through Vineyard Sound it is setting north through Quicks Hole, and vice versa.

Strong winds affect the regularity of the currents.

SAILING DIRECTIONS, QUICKS HOLE.

Strangers should not attempt to pass through Quicks Hole at night.

1. Passing through from the Southward.—Standing through Vineyard Sound, when Gay Head Lighthouse bears about S. $\frac{1}{2}$ W. the entrance will be fairly opened. Steer to the northward so as to enter about midway between Pasque and Nashawena islands leaving Nashawena Flats buoy (black, No. 1) on the port hand, when past this buoy steer about N. $\frac{1}{2}$ W. so as to leave Quicks Hole Ledge buoy (red, No. 2) about 100 yards on the starboard hand. When this buoy bears abeam, steer N. by E. into Buzzards Bay and leave Lone Rock buoy (red and black horizontal stripes) at least 250 yards on the port hand.

A black bell buoy lies off the entrance about $\frac{1}{2}$ mile SE. by S. from the southeastern end of Nashawena Island; a N. course made good from this buoy will lead close to the westward of red buoy No. 2, and about 250 yards to the eastward of Lone Rock buoy.

Remarks.—Black buoy No. 1 is on the end of the flats making to the southeastward from the western side of the entrance. Red buoy No. 2 is on the eastern side about halfway through the passage and marks the western edge of shoals making off from Pasque Island. The channel abreast the buoy is about 700 yards wide, which is its least width. Lone Rock, in Buzzards Bay, is marked by a red and black horizontal striped buoy, and can be avoided by keeping Gay Head open a little to the eastward of the eastern point of Nashawena Island.

1 A. Passing through from the Northward.—When Quicks Hole is opened so that Gay Head can be seen, steer to the southward so as to enter the passage about midway between Pasque and Nashawena islands; then steer for Gay Head, taking care to keep red buoy No. 2 on the port bow. Leave this buoy on the port hand and steer S. SE. into Vineyard Sound, leaving black buoy No. 1 on the starboard hand.

Remarks.—When north of the entrance care should be taken to avoid Lone Rock, which has 3 feet of water over it, lies nearly $\frac{1}{2}$ mile N. by E. $\frac{1}{2}$ E. from the northeastern point of Nashawena Island, and is marked by a buoy (red and black horizontal stripes). See also the remarks under section 1, foregoing.

BUZZARDS BAY†

indents the south shore of Massachusetts, in a general NE. direction, north of the Elizabeth Islands, the latter separating the bay from Vineyard Sound. The shores are irregular, being broken by bays and rivers, which, with the exception of New Bedford Harbor and Wareham River, are of little importance. The general character of the shore line is rocky; large bowlders are a prominent feature; these in some places extend out some distance into the bay, rendering close approach to the shore extremely dangerous.

The bay has deep water as far as Wings Neck Lighthouse above which it is full of shoals.

The entrances to the harbors are almost all obstructed by shoals and dangerous ledges but the channels are marked by buoys or other aids.

There are three entrances to the bay, two of which are used by sailing vessels. Woods Holl and Quicks Hole, the entrances from Vineyard Sound, are described on pages 85, 88 and above.

* Shown on charts 245, scale $\frac{1}{10,000}$, price \$9.25; 112, scale $\frac{1}{80,000}$, price \$9.50.

† Shown on chart 112, scale $\frac{1}{80,000}$, price \$9.50. The western entrance is shown on chart 118, scale $\frac{1}{80,000}$, price \$9.50. See also footnote on page 9.

The western and main entrance is between Cuttyhunk Island and the shore to the northward, Gooseberry Neck. Between these points it is about $5\frac{1}{2}$ miles wide, but the reef making to the westward from Cuttyhunk and another making to the southward from Gooseberry Neck leave an available width of 4 miles. Cuttyhunk Lighthouse and Hen and Chickens Light-vessel are the guides for entering and Gay Head Lighthouse and Vineyard Sound Light-vessel serve as guides for vessels approaching from the southward.

New Bedford Harbor, Clark Cove, Apponaganset Bay, Mattapoisett Harbor, Sippican Harbor, Pocasset Harbor, Wareham River, and the extreme northeastern end of the bay are described under separate headings. Cataumet, Wild, Hog Island, and Quamquisset harbors are small and shallow indentations along the eastern shore of Buzzards Bay, their relative positions being in the order named, beginning with the most northerly, which is about 8 miles to the northeastward of the northern entrance to Woods Holl. They are only available for small craft in the daytime and are of no commercial importance. At mean low water $8\frac{1}{2}$ feet may be taken into Cataumet Harbor, while the depth in the channels to the others varies from 5 to 7 feet at mean low water. The dangers of Cataumet and Quamquisset harbors are buoyed in accordance with the general system of buoyage in United States waters.

Pilots for Buzzards Bay and for many of its harbors can be had at Cuttyhunk or off the entrance of the harbor to which the vessel is bound. Pilotage is compulsory for certain vessels (see pilot laws in Appendix I).

Tides.—Tidal data for different points in the bay is given in the table, on page 22.

Tidal currents at the entrance of the bay are strong at times when they are influenced by the winds. In the passages from the bay to Vineyard Sound the currents are very strong and require special attention.

Ice.—The head of the bay and the harbors in its vicinity are generally closed to navigation during the winter months, and the approaches to the harbors on the eastern shore are rendered dangerous by drift ice, which in severe winters extends across the bay and joins the local formations on the western shore, thus forming an impassable barrier. In the severe winter of 1874-'75 the whole bay was closed during the greater part of the month of February as far down as a line from Dumpling Rock Lighthouse to Cuttyhunk Island. It forms more rapidly in the bay with the wind from N. to W. Under ordinary circumstances a NE. wind, if continued for 48 hours, will clear the bay of ice. Southerly winds, especially southeasters, diminish the extent and weaken the strength of the pack.

In New Bedford Harbor steamers can generally make their way in and out during the winter, but sailing vessels require the assistance of a powerful towboat to break the ice. During very severe winters, however, like that of 1874-'75, the harbor is at times entirely closed to all navigation. Ice forms rapidly in calms or light winds from N. to W. and strong winds from N. to NE. break it up and carry it off. The ice does not usually affect the positions of the spar buoys in the bay; but the light-vessels and even the buoys are sometimes carried away by unusually heavy floes.

SAILING DIRECTIONS, BUZZARDS BAY, TO WINGS NECK LIGHTHOUSE.

A draught of 21 feet can be taken up to Wings Neck Lighthouse by following the directions.

1. From Woods Holl.—Having passed through Woods Holl when Naushon Point Shoal buoy (black, No. 5) bears on the port beam distant about 100 yards, steer N. by E. $\frac{1}{2}$ E. about $9\frac{1}{2}$ miles. Wings Neck Lighthouse should then bear E. by S. distant $\frac{3}{4}$ mile.

Remarks.—Having stood on this course about 7 miles, Cataumet Harbor will be open on the starboard hand. The sailing line passes about $\frac{1}{2}$ mile to the westward of the buoys marking Southwest Ledge, the shoals between the entrances to Cataumet and Pocasset harbors. To avoid the ledges making off from the eastern shore it should be given a berth of at least 1 mile. There is a rocky spot, with 18 feet of water over it, lying about $1\frac{1}{2}$ miles W. from Nyes Neck, the point at the southern side of the entrance to Cataumet Harbor; this is left nearly $\frac{1}{2}$ mile on the port hand when on the sailing line.

1 A. From Quicks Hole.—Having passed through Quicks Hole from Vineyard Sound, when Lone Rock buoy (red and black horizontal stripes) is on the port beam distant about 200 yards, steer NE. $\frac{1}{2}$ N. about $15\frac{1}{2}$ miles. Wings Neck Lighthouse should then bear E. by S. distant $\frac{3}{4}$ mile.

Remarks.—This course leads clear of all dangers and nearly in the middle of the bay; having stood on it about 10 miles Mattapoisett Harbor will be off the port beam, and having stood on $2\frac{1}{2}$ miles farther, Sippican Harbor will be open forward of the port beam. Bird Island Lighthouse should be left about 1 mile on the port hand. Tempes Nob, a high wooded hill at the head of the bay, will be ahead.

1 B. From Hen and Chickens Light-vessel.—Steer for the light-vessel, keeping it bearing between E. $\frac{1}{2}$ S. through E. and N. to N. by W. $\frac{1}{2}$ W. Leave the light-vessel on either hand, bring it to bear W SW. $\frac{1}{4}$ W. astern, and steer ENE. $\frac{1}{4}$ E., keeping the bearing. Continue on this course about 13 miles, passing $\frac{1}{2}$ mile S. of the bell buoy off Mishaum Ledge and Wilkes Ledge buoy, and $1\frac{1}{2}$ miles S. of West Island Shoal buoy.

When Clark Point Lighthouse bears **NW.** by **W.** $\frac{1}{2}$ **W.** and is about in range with the south end of Sciticut Neck, steer **NE.** $\frac{1}{4}$ **N.** about $8\frac{1}{2}$ miles. Wings Neck Lighthouse should then bear **E.** by **S.** distant $\frac{3}{4}$ mile.

Remarks.—If passing to the northward of Hen and Chickens Light-vessel, give it a berth of less than $\frac{1}{2}$ mile. When about 5 miles to the eastward of the light-vessel on the **ENE.** $\frac{1}{2}$ **E.** course Dimpling Rock Lighthouse will bear about **N.** by **E.** distant $2\frac{1}{2}$ miles. The entrance to New Bedford Harbor will be left on the port hand and Clark Point Lighthouse will be seen. The large black can buoy off West Island Shoal can be seen a long distance. The **NE.** $\frac{1}{4}$ **N.** course leads well clear of all dangers and about 1 mile to the eastward of Bird Island Lighthouse.

Dangers.—**Sow and Pigs Reef**, with spots showing bare at low water, extends $1\frac{1}{2}$ miles in a general **WSW.** $\frac{1}{2}$ **W.** direction from the western end of Cuttyhunk Island. The western end of the reef is marked by a buoy (red, No. 2, with "Sow and Pigs" on side).

Hen and Chickens is the ledge making off nearly $1\frac{1}{2}$ miles to the southward from **Gooseberry Neck**, the point on the northern shore at the entrance to Buzzards Bay to the northward of Hen and Chickens Light-vessel. It has a number of spots with 4 to 9 feet of water over them, and near its southern end are several rocks which show bare at half tide. **Old Cock**, one of these rocks, is 3 feet out at low water and marked by a spindle (black, open work, cage on top). The southernmost end of the ledge is marked by a buoy (black, No. 1) which lies about $\frac{3}{4}$ mile to the northward of Hen and Chickens Light-vessel.

Ribbon Reef is a small detached ledge with 15 feet of water over it, lying nearly $1\frac{1}{2}$ miles **NW.** $\frac{1}{2}$ **N.** from Cuttyhunk Lighthouse. It is surrounded by deep water and marked off its northwestern side by a buoy (red and black horizontal stripes). About $1\frac{1}{2}$ miles **N.** from Ribbon Reef is a detached spot with 25 feet of water over it, on which thesea breaks in heavy **SW.** gales. It lies about $1\frac{1}{2}$ miles **E.** $\frac{1}{2}$ **S.** from Hen and Chickens Light-vessel.

Mishaum Ledge is a number of shoal rocky spots, one of which has a depth of 8 feet over it. The ledge lies $1\frac{1}{2}$ miles off the northern shore and about 3 miles to the eastward of Gooseberry Neck; it is marked off its southern end by a black bell buoy. Strangers should pass to the southward of this buoy.

There is a detached rock with 19 feet over it lying 1 mile **NW.** $\frac{1}{2}$ **N.** from the northern end of Penikese Island, and another detached rocky spot with 19 feet over it about $\frac{1}{2}$ mile **N.** by **E.** from the northern end of the island. The channel between the northernmost of these rocks and Mishaum Ledge is about $1\frac{1}{2}$ miles wide.

Wilkes Ledge is a detached rocky spot about 400 yards in diameter and a least depth of 10 feet over it, lying $1\frac{1}{2}$ miles **S.** $\frac{1}{2}$ **E.** from Dimpling Rock Lighthouse. It is marked off its southern side by a buoy (red and black horizontal stripes).

Shoals make out about 1 mile to the southward from Sciticut Neck and West Island, but the southern edge is marked by buoys, and all will be cleared if Bird Island Lighthouse is kept bearing a little to the northward of **NE.**

A small detached 18-foot spot lies nearly $2\frac{1}{2}$ miles **S.** by **E.** $\frac{1}{2}$ **E.** from Bird Island Lighthouse. This can be avoided by keeping Wings Neck Lighthouse bearing to the eastward of **NE.**

NEW BEDFORD HARBOR.*

This harbor lies on the northwestern side of Buzzards Bay and is the approach to the city of New Bedford and the towns of Fairhaven and Acushnet. The approach from Buzzards Bay and the entrance to the harbor are much obstructed by ledges and shoals. These, however, are well marked by buoys and other aids, so that in the daytime with clear weather, no difficulty should be experienced in entering if assisted by the chart or sailing directions. Sailing vessels should not attempt to beat into the harbor unless well acquainted with the dangers. The approach between Sciticut Neck on the east and Dimpling Rock Lighthouse on the west is nearly 4 miles wide, and also serves as the approach to Apponaganset Bay and Clark Cove. The entrance to the harbor on its western side is marked by Clark Point Lighthouse (see table, page 14) and 2 miles **N.** from this by Palmer Island Lighthouse; on its eastern side are extensive shoals, which are marked by a large white stone beacon. The channel, for a distance of $\frac{1}{2}$ mile south of Palmer Island Lighthouse to the anchorage off New Bedford, is comparatively narrow but is well marked by buoys and a range. At the head of the harbor, crossing the mouth of the Acushnet River, is a bridge with a draw near its western end about 60 feet wide. The principal water-borne trade of New Bedford is coal, cotton, and whale oil, and the greatest draught of vessels entering the inner harbor is about 21 feet. There is 16 to 22 feet of water alongside the wharves, according to location. The greatest draught taken up to Wamsutta Mills is about 13 feet at high water.

Channels.—The channel from the deep water off Clark Point to the wharves at the city of New Bedford has been improved, under the supervision of the U. S. Army Engineers, and a channel 18 feet deep and 100 feet wide (and much wider for a depth of 15 feet) leads up to the city wharves. It is proposed to widen this channel to 200 feet. There are several channels leading up to Clark Point between the ledges, which are sufficiently described in connection with the sailing directions.

Ranges.—In entering in the daytime, besides the buoys to guide a vessel, the range for the inner harbor is Palmer Island Lighthouse, in range with the tall chimney (the second one from the right) of the Wamsutta Mills. At night a white electric light close to the chimney should be kept in range with Palmer Island Light.

*Shown on charts 250, scale $\frac{1}{40,000}$, price \$0.20; 113, scale $\frac{1}{80,000}$, price \$0.50.

Anchorage.—The anchorage in what is known as the outer harbor, to the eastward and southward of Clark Point, has depths of 4 to 4½ fathoms, but is exposed to southerly winds. The deepest draught vessels entering the port sometimes anchor here to lighten part of their cargo before going up to the city. The anchorage above Palmer Island has a limited area with a depth of about 18 feet; the remainder has depths from 9 to 15 feet. This anchorage is well sheltered and has good holding ground. Light draught vessels can anchor on the western side of the harbor, giving the wharves a berth of about 150 yards.

Pilots are generally taken by all large vessels, and may be had by signaling off Cuttyhunk Lighthouse. In good weather pilots often board incoming vessels as far south as No Mans Land. Pilotage is compulsory for vessels in the foreign trade, but concessions are made to whalers. Pilot fees for incoming vessels are \$2.25 per foot; for outward bound vessels \$1.85 per foot. In winter, from October 1 to April 1, 20 per cent is added to the above fees. For general pilot laws for the State of Massachusetts see Appendix I.

Towboats are generally taken by vessels wishing to enter the inner harbor, and are generally to be found off Clark Point. A lookout for incoming vessels is kept from the custom-house by the towboat captains, when they are not cruising.

Harbor regulations for this port are contained in the extracts from the Laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix I.

Quarantine regulations.—The following are extracts from the Rules and Regulations published by order of the board of aldermen.

1. Every vessel arriving from a foreign port, between May 1 and November 1, shall immediately proceed to the quarantine grounds, and shall be visited by the quarantine officer between sunrise and sunset as soon as possible after such arrival. Such officer shall examine the bill of health, and shall inspect the vessel.

5. A quarantine shall be had of all vessels, their officers and crews, passengers and cargoes that come within the harbor of New Bedford, on board of which any person shall have died or been sick of any contagious, infectious, or malignant disease during the passage to New Bedford, or which are foul or infected after their arrival, or which are from, or have brought their present cargo or any part thereof from any port or place where any infectious, contagious, or malignant disease prevails, or recently has prevailed; provided, however, that in the latter case public notice shall first be given by the board of health of such fact of the prevalence of infectious, contagious, or malignant disease.

6. The quarantine shall be had and performed at an anchorage ground near the Egg Islands in said harbor, bounded as follows: Butler Flats on the southeast shore of Clark Point on the west, Eleven Foot bank on the north, and the Egg Islands on the east, under the direction of the quarantine physician; and shall continue on every such vessel until the master shall receive a certificate from the said physician that he may be discharged.

8. During the time that such vessel is performing quarantine, no person without a permit from the quarantine physician shall go on board thereof, except those employed by or under the quarantine physician, and no person without a permit as aforesaid shall go within a line upon the land adjoining any public hospital, to be designated by the quarantine physician, except as aforesaid.

The Marine Hospital Service has a representative at the custom-house who will secure treatment for out patients and transportation of patients to a Marine Hospital when necessary. Extract from the Revised Regulations for the government of the Marine Hospital Service are given in Appendix III.

Supplies.—Coal in unlimited quantities, water, and ship's stores may be obtained and will be put on board either at the wharves or anchorage.

Repairs.—There are two small marine railways at New Bedford, capable of hauling out vessels of 200 or 300 tons. At Fairhaven there is a marine railway by which vessels of as much as 600 tons may be hauled out.

Wind signals of the U. S. Weather Bureau are displayed from a staff on one of the coal pockets of the Philadelphia and Reading Coal and Iron Company. An explanation of the use and meaning of these signals is given in Appendix II.

Ice.—See page 89.

Tides.—The mean rise and fall of tides is 4.2 feet (see also table on page 22).

SAILING DIRECTIONS, NEW BEDFORD HARBOR.

The following directions are good for a draught of 20 feet as far as the anchorage off Clark Point and for 17 feet to the anchorage in the inner harbor. Vessels entering at night should follow the directions in section 1; strangers should not stand above Clark Point at night. The directions in sections 1A, and 1B, should be used by strangers only in the daytime with clear weather.

1. Approaching and Entering to Clark Point by the East Channel.—I. *Coming from the Northward.*—Steer SW. and keep Bird Island Lighthouse bearing to the northward of NE. When Dumping Rock Lighthouse bears W. $\frac{1}{2}$ S. steer for it, passing to the eastward of black buoy No. 9 off West Island Shoal. When Clark Point Lighthouse bears N NW. $\frac{1}{2}$ W. steer for it and follow the directions in paragraph V.

II. *Having come through Woods Holl.*—From the black buoy at the northern entrance to Woods Holl, steer NW. about $1\frac{1}{4}$ miles until past Weepecket Rock buoy (red and black horizontal stripes); then steer W NW. until Clark Point Lighthouse bears N NW. $\frac{1}{2}$ W.; steer for the light on this bearing, and follow the directions in paragraph V.

III. *Having come through Quicks Hole.*—When standing on the N. by E. course through Quicks Hole, continue it for $5\frac{1}{2}$ miles; Clark Point Lighthouse should then bear N NW. $\frac{1}{2}$ W. Steer for the Lighthouse on this bearing, and follow the directions in paragraph V.

IV. *From Hen and Chickens Light-vessel.*—See the directions in section 1B, page 89. Bring the light-vessel to bear W SW. $\frac{1}{4}$ W. and steer E NE. $\frac{1}{4}$ E., keeping on the bearing. When Dumping Rock Lighthouse is on the port beam, steer NE. $\frac{3}{4}$ E. until Clark Point Lighthouse bears N NW. $\frac{1}{2}$ W., and follow the directions in paragraph V.

V. *To Clark Point Lighthouse.*—Steer for Clark Point Lighthouse bearing N NW. $\frac{1}{2}$ W. until Dumping Rock Lighthouse is on the port beam; then steer N. by W. and anchor in $4\frac{1}{2}$ fathoms water, with Clark Point Lighthouse, bearing between W NW. and W SW., or proceed as directed in section 2, following.

Remarks.—When approaching the entrance the numerous buoys seen may confuse anyone not perfectly familiar with the harbor and the many ledges and rocks at the entrance; a stranger should pay particular attention to the bearings of the lighthouses and not attempt to run in by the buoys alone. The courses lead well clear of all dangers and to the southward of the buoys until standing for Clark Point Lighthouse. On the N NW. $\frac{1}{2}$ W. course Hursell Rock buoy is left on the port hand and the bell buoy on Mosher Ledge on the starboard hand; a number of buoys will be seen on the port hand; these mark the dangers between the east and west channels into New Bedford. The old white tower and granite fort on Clark Point will show conspicuously ahead, and the large red building on the west shore of Clark Cove will be on the port bow. The low square church tower in Fairhaven, which, with the white pyramidal beacon on the beach a short distance to the eastward of the eastern point of the entrance to the inner harbor, forms a range for the East Channel, will be seen on the starboard bow.

When on the N. by W. course Egg Island beacon will be a little on the starboard bow, and Fort Point, the eastern point at entrance to the inner harbor, will be ahead. Palmer Island Lighthouse should be made a little on the port bow; Henrietta Rock and Packet Rock buoys will be left on the starboard hand, and the two North Ledge buoys (black, No. 3 and 3A) on the port hand. Before Clark Point Lighthouse bears abeam Butler Flat buoy (black, lighted at night) should be made a little on the port bow.

Dangers.—The outlying dangers approaching the entrance are described on page 90.

Hursell Rock, a small detached rock with $14\frac{1}{2}$ feet of water over it, lies $2\frac{1}{2}$ miles E. $\frac{1}{2}$ N. from Dumping Rock Lighthouse and $3\frac{1}{4}$ miles S SE. from Clark Point Lighthouse; it is marked by a buoy (red and black horizontal stripes). In heavy southerly gales this buoy should be given a berth of at least 500 yards, as the rock is surrounded for this distance by depths of less than 5 fathoms, over which the sea occasionally breaks.

West Island Ledge is on the north side of the channel, and has a depth of 1 to 9 feet over it. A buoy (red, No. 2) is placed off the southern end of the ledge.

Mosher Ledge is about 700 yards in diameter, has a least depth of 6 feet of water over it, and lies about 1 mile S. by W. from the southern end of Sciticut Neck. It is marked off its southern end by a red bell buoy.

Henrietta Rock is a small detached ledge, with 11 feet of water over it, lying nearly 1 mile SW. by W. $\frac{1}{2}$ W. from the southern end of Sciticut Neck.

North Ledge is about 800 yards long N. and S. and about 400 yards wide; it has depths of 7 to 17 feet over it, and lies about $1\frac{1}{4}$ miles S. by E. $\frac{1}{2}$ E. from Clark Point Lighthouse. The southeast and northeastern ends of the ledge are marked buoys (black, Nos. 3 and 3A respectively).

Packet Rock Ledge is on the eastern side of the channel, about $\frac{1}{2}$ mile to the northward of Henrietta Rock and $\frac{1}{2}$ mile W NW. $\frac{1}{2}$ W. from the spindle on Black Rock. The western side of the ledge is marked by a buoy (red, No. 6).

Packet Rock, with 5 feet of water over it, is part of Packet Rock Ledge; it is marked on its eastern side by a buoy (black, No. 1).

Shoals make off $\frac{1}{2}$ mile to the southward from Clark Point; their southern end, with 17 to 18 feet over it, lies about S. by E. from the lighthouse.

Old Bartlemy is a rock, with 1 foot of water over it, lying 400 yards E. from Clark Point Lighthouse. A buoy (black, No. 7) is placed on the edge of the channel to the eastward of the rock.

1 A. Approaching and Entering by the Middle Channel.—With Hen and Chickens Light-vessel bearing W SW. $\frac{1}{4}$ W. steer E NE. $\frac{1}{4}$ E. Pass from $\frac{1}{4}$ to $\frac{1}{2}$ mile south of Wilkes Ledge buoy, and when Dumping Rock Lighthouse bears abaft the beam bring Clark Point Lighthouse to bear N. $\frac{1}{4}$ E. and steer for it, keeping close on the bearing. When Decatur Rock buoy (red, No. 8) is

about 300 yards distant on the starboard beam, steer **N.** by **E.** $\frac{1}{2}$ **E.** and anchor when Clark Point Lighthouse bears between **W NW.** and **W SW.** If bound to New Bedford, follow the directions in section 2, following.

Or, follow the directions preceding until Wilkes Ledge buoy bears abeam and then steer **N.** by **E.** for Clark Point Lighthouse. Pass about 250 yards to the westward of Great Ledge (**W.** part) buoy (red, No. 6), and when Dumpling Rock Lighthouse is 2 points abaft the beam steer **N.** by **E.** $\frac{1}{2}$ **E.** for Egg Island beacon. Anchor about $\frac{1}{2}$ mile to the eastward of Clark Point Lighthouse when it bears between **W NW.** and **W SW.** If bound to New Bedford follow the directions in section 2.

Remarks.—On the **N. $\frac{1}{2}$ E.** course careful attention should be paid to the buoys. Great Ledge (**E.** side) buoy should be left about 250 yards on the port hand. Phinney Rock buoy is left $\frac{3}{4}$ mile and Church Rock and Decatur Rock buoys about 400 yards on the starboard hand. Phinney Rock buoy is colored and numbered for the channel between it and Hursell Rock. The old white tower and granite fort on Clark Point will be conspicuous ahead.

On the **N.** by **E.** course, after passing Wilkes Ledge buoy, two buoys should be made on the starboard bow; these mark the eastern and western ends of Great Ledge. The western buoy should be left at least 250 yards on the starboard hand.

On the **N.** by **E.** $\frac{1}{2}$ **E.** course Egg Island beacon should be made ahead; on a clear day it will be readily distinguished, its white sides showing distinctly against a dark back ground of trees. The red buoys marking Church and Decatur rocks will be left on the starboard hand. The buoys marking North Ledge will be left over $\frac{1}{2}$ mile on the starboard hand. As Clark Point is approached the black buoy marking Old Bartlemy will be seen to the eastward of the lighthouse, and when the lighthouse bears about **W.** Butler Flat buoy and Egg Island Shoal buoy will be seen to the northward.

Dangers.—The dangers until up to Wilkes Ledge are described on page 90.

Great Ledge is nearly 400 yards in diameter and lies $1\frac{1}{2}$ miles **E. $\frac{1}{2}$ S.** from Dumpling Rock Lighthouse; it has a least depth of 7 feet over it and is marked by two buoys, one at the eastern end (black, No. 7) and one at the western end (red, No. 6).

The Sand Spit is a ledge lying from $\frac{1}{2}$ to $\frac{3}{4}$ mile **SE.** by **S.** from Dumpling Rock Lighthouse; it has a least depth of 7 feet over it and is marked at its western end by a buoy (red, No. 2), which is colored and numbered for the west channel. Vessels passing to the eastward of the buoy should give it a berth of at least $\frac{1}{2}$ mile.

Phinney Rock, a small detached rock with 11 feet of water over it, lies between the East and Middle channels, about $1\frac{1}{2}$ miles **E NE.** $\frac{1}{2}$ **E.** from Dumpling Rock Lighthouse; it is marked off its eastern side by a buoy (black, No. 1A). There is a depth of $4\frac{1}{2}$ fathoms between this rock and Church Rock, the one to the northward.

Church Rock has a depth of 9 feet over it and lies about $\frac{1}{2}$ mile to the northward of Phinney Rock; it bears **S. $\frac{1}{2}$ E.** distant a little over 2 miles from Clark Point Lighthouse and is marked on its western side by a buoy (red, No. 6A).

Decatur Rock has a least depth of 5 feet over it and lies a little over $\frac{1}{2}$ mile to the northward of Church Rock. It is marked off its northwestern end by a buoy (red, No. 8).

North Ledge and Old Bartlemy are described under section 1, preceding.

1 B. *Approaching and Entering by the West Channel.*—With Hen and Chickens Light-vessel bearing **W SW.** $\frac{1}{4}$ **W.**, steer **E NE.** $\frac{1}{4}$ **E.** until Dumpling Rock Lighthouse bears **NE.** by **N.** then steer for the lighthouse on this bearing. When the red buoy on the Sand Spit is made, steer so as to pass about 200 yards to the westward and northward of it and about 600 yards to the southeastward of the lighthouse. When passing this buoy, shape the course **N NE.** $\frac{3}{4}$ **E.**, pass about 600 yards to the eastward of the lighthouse and at least 250 yards to the eastward of Middle Ledge buoy. Continue the course until Clark Point Lighthouse bears between **W NW.** and **W SW.**, then anchor about $\frac{1}{2}$ mile to the eastward of it, or follow the directions in section 2.

Dumpling Rock Lighthouse can be steered for bearing anywhere between **NE.** by **N.** and **N.**

Remarks.—The **NE.** by **N.** course leads about $\frac{3}{4}$ mile to the eastward of the bell buoy off Mishaum Ledge and about the same distance to the eastward of Salter Point Ledge buoy. Wilkes Ledge buoy will be left well on the starboard hand. Round Hill, the point just to the westward of Dumpling Rock Lighthouse, will show quite prominently. As Dumpling Rock Lighthouse is approached the buoy on Sand Spit and buoy marking the shoals to the southward of the lighthouse will be seen; the sailing line leads about midway between these buoys. Clark Point Lighthouse will be opened to the eastward of Dumpling Rock Lighthouse. On the **N NE.** $\frac{3}{4}$ **E.** course Middle Ledge buoy should be made on the port bow and be left on the port hand; when past this buoy Inez Rock buoy will be seen and left on the port hand. The buoys marking Church and Decatur rocks and North Ledge will be left well on the starboard hand. Clark Point will be left about $\frac{1}{2}$ mile on the port hand.

Dangers.—The dangers until up to Wilkes Ledge are described on page 90.

Salter Point Ledge is a detached rock, with 1 foot of water over it, and lies a little over 1 mile **SW. $\frac{1}{2}$ W.** from Dumpling Rock Lighthouse; it is marked on its eastern side by a buoy (black, No. 5).

The Sand Spit and Great Ledge are described under section 1 A, preceding.

Dumpling Rocks have 8 to 11 feet over them, and extend to the southward and southwestward from the small island on which the lighthouse is situated. The eastern edge of these rocks is marked by a buoy (black, No. 7).

White Rock is a small bare rock lying $\frac{1}{2}$ mile N. by E. from Dumpling Rock Lighthouse. It is a prominent mark for vessels bound into Apponaganset Bay. **Ragged Rocks** and **Fatal Rock** lie to the westward of White Rock, between it and the shore.

Middle Ledge is a small detached ledge, with 3 feet of water over it, lying nearly $1\frac{1}{2}$ miles NE. $\frac{1}{2}$ N. from Dumpling Rock Lighthouse; it is marked at its southeastern side by a buoy (red and black horizontal stripes).

Inez Rock, a small detached rock, with 6 feet of water over it and marked by a buoy (red and black horizontal stripes), lies about $\frac{1}{2}$ mile NNE. from Middle Ledge.

Church Rock and **Decatur Rock** are described on page 93, and **North Ledge** and **Old Bartlemy** on page 92.

2. From Clark Point to an Anchorage in the Inner Harbor.—When Clark Point Lighthouse bears W., distant over $\frac{1}{2}$ mile, steer NNE. Watch the bearing of Palmer Island Lighthouse; when it bears N. by W. $\frac{1}{2}$ W. and is in range with the tall chimney (second one from the right) of Wamsutta Mills, steer for it and keep the range. At night the electric light close to the chimney should be kept in range with Palmer Island Light. Pass close to the eastward of Butler Flat buoy and continue on the range until red buoy No. 12 is passed; then haul a little to the northward and head so that the ends of the wharves in Fairhaven will be a little on the starboard bow. Leave Palmer Island Lighthouse about 150 yards on the port hand and anchor about 400 yards NNE. from the lighthouse in 18 to 20 feet water, soft bottom.

If of less than 9 feet draught, when about 400 yards to the northward of Palmer Island Lighthouse steer about NW. and anchor over towards the wharves, giving them a berth of at least 100 yards.

Remarks.—When heading for Palmer Island Lighthouse red buoy No. 10 and Egg Island beacon are left about 400 yards on the starboard hand, and when past the beacon several buoys will be seen on both bows. Before the first buoy (black, No. 11) is reached care should be taken to keep fair on the range, which will lead to the eastward of black buoys Nos. 11 and 13 and about 40 yards to the westward of red buoy No. 12. When the course is changed to the northward from this buoy it should lead about 50 yards to the westward of red buoy No. 14, and about 30 yards to the eastward of black buoy No. 15. The anchorage to the northeastward of Palmer Island Lighthouse is known as the **Deep Hole**.

Dangers.—Butler Flat makes off $\frac{1}{2}$ mile from the western shore, about $\frac{1}{2}$ mile to the northward of Clark Point Lighthouse; it has 4 to 12 feet of water over it and is marked at its eastern edge by a buoy (black, white light at night).

Egg Island Flat is the extensive shoal which lies on the eastern side of the channel and surrounds Egg Island beacon, extending $\frac{1}{2}$ mile to the southeastward from it. The shoalest part of the flat is to the northeastward and eastward from the beacon. A buoy (red, No. 10) is placed in 12 feet of water, about 400 yards to the southward of the beacon, as a guide to keep vessels off the shoal part of the flat. Egg Island beacon is a white granite cone with spindle and vane on top.

Shoals extend along the eastern side of the channel from Fort Point to Egg Island beacon.

Eleven-foot Bank makes off from the western shore about $\frac{1}{2}$ mile to the southward of Palmer Island Lighthouse; it has from 7 to 11 feet of water over it and is marked at its eastern edge by a buoy (black, No. 11).

Palmer Island Shoal surrounds Palmer Island and extends nearly $\frac{1}{2}$ mile to the southward from it. The eastern edge is marked by two buoys (black, Nos. 13 and 15).

Fort Flat extends to the southward and westward from Fort Point, the eastern point at entrance to the inner harbor. The western edge of the flat is marked by two buoys (red, Nos. 12 and 14).

Dix Ledge has 3 feet of water over it and lies well over towards the eastern shore of the inner harbor, about ENE. $\frac{1}{2}$ E. from Palmer Island Lighthouse; it is marked on its western side by a buoy (red, No. 16).

Crow Island lies in the northeastern part of the harbor, about 160 yards from the upper wharves in Fairhaven. The water is shallow to the eastward and northeastward of the island; there is 10 to 12 feet of water to the southward and westward of the island.

CLARK COVE *

makes to the northward just west of the entrance to New Bedford Harbor; between Clark Point—marked by a granite fort and lighthouse—on the east, and Moshers Point on the west, the entrance is about $\frac{1}{2}$ mile wide. The cove has anchorage in 12 to 18 feet water but is seldom used, being exposed to southerly winds; the best water is on the eastern side where the channel is marked by several buoys. A large red factory on the west shore, a short distance above Moshers Point, is a conspicuous feature, and the houses and spires of the city of New Bedford can be seen at the head of the cove.

The rise and fall of tides is the same as at New Bedford (see table, page 22).

SAILING DIRECTIONS, CLARK COVE.

The following directions are good for a draught of 14 feet to an anchorage above Moshers Point. Vessels of greater draught, if bound to the guano factory, should anchor off Moshers

* See footnote on page 90.

Point and wait for a fair tide to go alongside the wharf. If entering at night, anchor to the southward of Clark Point Light and wait for daylight. See also the note preceding the sailing directions for New Bedford Harbor.

Approaching and entering.—Follow the directions in sections 1, 1 A, or 1 B, pages 92, 93, for approaching and entering New Bedford Harbor.

I. If following the directions in section 1, page 92.—When on the **N NW. $\frac{1}{2}$ W.** course Dumpling Rock Lighthouse bears abeam, steer **NW. $\frac{1}{4}$ N.**, taking care to pass to the northward of black buoy No. 3 A.

After passing this buoy Clark Point buoy (red, No. 2) should be made on the starboard bow. Pass well to the southward of this buoy and then haul to the northward course about **N. by W. $\frac{1}{4}$ W.** and pass about 100 yards to the westward of it. Red buoy No. 4 should be made on the starboard bow. Anchor when abreast the wharf of the guano factory and about 400 yards from the eastern shore of the cove.

II. If following the directions in section 1 A, page 92.—Steer for Clark Point Lighthouse on the **N. $\frac{1}{4}$ E.** or **N. by E.** course until abreast of and about 400 yards to the westward of Decatur Rock buoy (red, No. 8), when steer **N. by W. $\frac{1}{4}$ W.** Pass to the westward of red buoy No. 2, and anchor as directed in the preceding paragraph.

III. If following the directions in section 1 B, page 93.—When on the **N NE. $\frac{3}{4}$ E.** course and a little over $\frac{1}{2}$ mile past Inez Rock buoy, steer **N. by W. $\frac{1}{4}$ W.** Pass about 100 yards to the westward of red buoy No. 2, and anchor as directed in paragraph I.

For *remarks* and *dangers* see those under sailing directions for New Bedford Harbor. After entering the cove there are no dangers, until near the head of the harbor, for vessels of 12 feet or less draught if the shores be given a berth of about 400 yards.

APPONAGANSET BAY*

is the bight to the southwestward of Clark Cove and about 2 miles to the northward of Dumpling Rock Lighthouse, and is the approach by water to the village of South Dartmouth. The extension of the bay above the bridge at South Dartmouth is known as Apponaganset River, into which several small streams flow. About 1 mile above the bridge, on the east bank of the river, is the village of Apponaganset.

Apponaganset Bay is sometimes called Padanaram Harbor. It is shallow and of but little importance, the depth above the entrance ranging from 7 to 12 feet; small coasting vessels occasionally enter with cargoes of coal and building material for local use, and small yachts sometimes anchor here during the summer, but the anchorage is insecure in southeasterly storms. The approach to the bay is obstructed by numerous ledges and rocks, some of which are described under the heading, New Bedford Harbor. A stranger should not attempt to enter except in the daytime with clear weather.

The mean rise and fall of tides is the same as in New Bedford Harbor (see table, page 22).

SAILING DIRECTIONS, APPONAGANSET BAY.

1. Approaching and Entering from the Eastward.—Coming down Buzzards Bay pass about 200 yards to the eastward and southward of the black buoy (No. 9) on West Island Shoal and steer **W. $\frac{1}{2}$ S.** Leave Hursell Rock buoy (red and black horizontal stripes) about 400 yards on the port hand and Phinney Rock buoy (black, No. 1 A) about 300 yards on the starboard hand. When the latter buoy bears abeam, steer **NW. by W.** for Middle Ledge buoy (red and black horizontal stripes); leave this buoy about 250 yards on the starboard hand and steer **NW. $\frac{1}{2}$ N.** for the entrance to the harbor. Leave Lone Rock buoy (red and black horizontal stripes) about 300 yards on the starboard hand and stand into the harbor, giving the eastern shore a berth of about 400 yards. Dartmouth Rock buoy (red, No. 6) will be made on the starboard bow; leave it about 200 yards on the starboard hand on a **N. by W. $\frac{1}{2}$ W.** course and when a little less than $\frac{1}{4}$ mile past it anchor in 10 to 14 feet of water.

Remarks.—On the **W. $\frac{1}{2}$ S.** course Dumpling Rock Lighthouse will be ahead. On the **NW. $\frac{1}{2}$ N.** course a number of white houses on the western shore of the bay will be directly ahead.

Bicketsons Point, the northern point at entrance to the bay, should be given a berth of at least 400 yards to insure clearing the rocks and shoal lying off it.

* See footnote on page 90.

Dangers.—The principal dangers, Hursell Rock, Phinney Rock, Great Ledge, and Middle Ledge, are described under the sailing directions for New Bedford Harbor, pages 92, 93, and 94.

White Rock, Ragged Rocks, and Fatal Rock lie about $\frac{1}{2}$ mile off shore and about the same distance N. of Dumpling Rock Lighthouse and are always bare and easily seen. Several other rocks lie close in to the western shore. The sailing lines lead well clear of all of these.

Hussey Rock, with 4 feet of water over it, is $\frac{3}{4}$ mile off shore, 1 mile N. of Dumpling Rock Lighthouse, and is marked by a buoy (black, No. 1).

1 A. *Approaching and Entering from the Westward.*—Follow the directions in section 1 B page 93 until Dumpling Rock Lighthouse bears **W.** distant about $\frac{1}{4}$ mile, then steer **N.**, passing about 300 yards to the eastward of White Rock and the same distance to the eastward of Hussey Rock buoy (black, No. 1). When this buoy bears a little abaft the beam, steer **N NW. $\frac{1}{4}$ W.** into the harbor.

Anchor as directed in section 1, preceding.

Remarks and dangers.—See under section 1, foregoing.

MATTAPOISETT HARBOR*

lies about 4 miles to the northeastward of New Bedford Harbor, and is marked on its north side by **Ned Point Lighthouse** (see table, page 14). The entrance between **Angelica Point** on the east and **Mattapoisett Neck** on the west is about $1\frac{1}{2}$ miles wide, but is very much obstructed by shoals and ledges, between which a buoyed channel leads to the anchorage off the village of **Mattapoisett**, which is situated on the north shore about $\frac{1}{2}$ mile above Ned Point. The harbor is exposed to southeasterly winds, but the ledges at the entrance somewhat break the sea from that direction; it is little frequented except by yachts. The carrying trade of Mattapoisett is comprised in a few cargoes of coal and building material for local use. The least depth in the channel as far as the anchorage off the village is 12 feet at mean low water. A draught of 8 feet may be taken to the wharves and 14 feet to the anchorage off Ned Point.

Pilots are not usually taken, but one may be had by signaling when off the entrance, anchoring if necessary until one comes from the shore. Pilotage is compulsory only for certain vessels. See pilotage laws in Appendix I.

Tides.—The mean rise and fall of tides is 3.9 feet; corrected establishment 7^h 57^m.

SAILING DIRECTIONS, MATTAPOISETT HARBOR.

The following directions lead to the anchorage with 14 feet water to the southwestward of Ned Point. Anchorage in 10 to 12 feet water will be found off the wharves of the town. Strangers should not attempt to enter at night.

1. *Approaching and Entering from Woods Holl or from Quicks Hole.*—Having come through Woods Holl, when black buoy No. 5 at the western side of the entrance to Woods Holl bears **W.** distance about 200 yards steer **N.** by **W. $\frac{1}{2}$ W.** about $5\frac{1}{2}$ miles; Ned Point Lighthouse should then be seen bearing about **N NW.** and the buoy (red and black horizontal stripes) on Nye Ledge should be about $\frac{1}{2}$ mile distant and just open to the left of the lighthouse. Steer for Ned Point Lighthouse, keeping it bearing **N NW.**; leave Nye Ledge buoy, Mattapoisett Ledge buoy, and Gallatin Rock buoy at least 200 yards on the port hand, and when the latter buoy is on the port beam haul more to the westward, course about **NW. $\frac{1}{2}$ W.** Pass about 150 yards north of Sunken Ledge buoy, and when it is well abaft the port beam steer about **N NW.** and anchor when Ned Point Lighthouse bears to the eastward of **NE.**

If desiring to anchor off the town, continue the **N NW.** course and anchor to the southward of the wharves, giving them a berth of 300 yards.

Having come through Quicks Hole. When to the eastward of Lone Rock buoy steer **NE. $\frac{1}{4}$ N.** about $9\frac{1}{2}$ miles, until Ned Point Lighthouse bears **N NW.**, then steer for it on that bearing and follow the directions above.

Remarks—On the **N NW.** course for Ned Point Lighthouse, the buoys marking the channel will be on the port hand. When the course is changed to **NW. $\frac{1}{2}$ W.**, Snow Rock buoy (red, No. 4) should be on the starboard bow and Sunken Ledge buoy on the port bow; a low point with a small clump of trees upon it will be seen right ahead. When on the **N NW.** course for the anchorage, Barstow Rock buoy should be left about 250 yards on the starboard hand. The lead should be used when standing to the anchorage; the water shoals gradually toward the wharf at the head of the harbor.

* Shown on chart 112, scale $\frac{1}{80,000}$, price \$0.50.

Dangers.—Nye Ledge is a large detached ledge, with 7 feet of water over it, lying nearly $1\frac{1}{2}$ miles to the southeastward of Mattapoisett Neck, and is marked off its eastern end by a buoy (red and black horizontal stripes). The ledge can be avoided by keeping Bird Island Lighthouse bearing to the northward of NE. until Ned Point Lighthouse bears to the westward of NNW. There is a narrow channel to the westward of this ledge, but strangers should not attempt it.

Mattapoisett Ledge extends nearly 1 mile to the southeastward from Mattapoisett Neck, has a depth of 5 feet about $\frac{1}{2}$ mile from the shore, and is marked at its eastern end by a buoy (black, No. 1).

Gallatin Rock, a detached rock with 11 feet of water over it, lies on the western side of the entrance, about $1\frac{1}{2}$ miles S. by E. from Ned Point Lighthouse, and is marked off its eastern side by a buoy (black, No. 3).

Sunken Ledge has 3 feet of water over it and lies $\frac{1}{2}$ mile from the western shore S. by W. from Ned Point Lighthouse, and is marked off its eastern side by a buoy (black, No. 5).

Snow Rock, with a least depth of 5 feet over it, lies on the eastern side of the channel, about $\frac{1}{2}$ mile S. $\frac{1}{2}$ E. from Ned Point Lighthouse, and is marked by a buoy (red, No. 4).

Barstow Rock, a detached rock with about 6 feet of water over it, lies a little over $\frac{1}{2}$ mile S. $\frac{1}{2}$ W. from Ned Point Lighthouse, and is marked by a buoy (red and black horizontal stripes) placed off its southern end.

Ned Point Shoal makes off about 400 yards to the southeastward from the point and is marked by a buoy (red, No. 6) off its end.

Landing Rock, with about 7 feet of water over it, lies about 100 yards from the wharf, on northern shore of the harbor and about $\frac{1}{2}$ mile NW. by W. from Ned Point Lighthouse, and is marked by a buoy (red, No. 8).

1 A. *Approaching and Entering from Han and Chickens Light-vessel.*—Follow the directions in sections 1 B, page 89, until Clark Point Lighthouse bears NW. by N.; then steer NE., passing about $\frac{1}{2}$ mile to the eastward of West Island Shoal buoy. When Ned Point Lighthouse bears N NW. steer for it and follow the directions in section 1, preceding.

Remarks.—The remarks and dangers up to West Island Shoal are given under the sailing directions, Buzzards Bay, section 1 B, page 90.

When on the NE. course care should be taken to keep Bird Island Lighthouse bearing to the northward of NE. until Ned Point Lighthouse comes on the NNW. bearing; this will clear Cormorant Rock and Nye Ledge, the two most prominent dangers off the western shore between New Bedford entrance and Mattapoisett Harbor.

Dangers.—Cormorant Rock, which shows bare at half tide and is marked by a spindle (black, with cage on top), lies $1\frac{1}{2}$ miles NE. by E. from the southeastern point of West Island and $2\frac{1}{2}$ miles S. $\frac{1}{2}$ W. from Ned Point Lighthouse. Shoal water extends a little over $\frac{1}{2}$ mile to the southward of the spindle and about 200 yards to the eastward of it. There is a channel between the rock and Mattapoisett Neck, but strangers should not attempt it.

Nye Ledge and the dangers in Mattapoisett Harbor are described above.

SIPPICAN HARBOR *

makes in to the north shore of Buzzards Bay about $2\frac{1}{2}$ miles to the northeastward from Mattapoisett entrance, and is marked by Bird Island Lighthouse (see table, page 14), which is on a small low island $\frac{1}{2}$ mile to the southward of the eastern point at the entrance to the harbor. The entrance between Great Neck (formerly known as Sippican Neck) on the east and Blake Point (formerly known as Charles Neck) on the west is about $1\frac{1}{2}$ miles wide and has few dangers. Above the entrance the width of the harbor gradually lessens, and at Ram Island, $2\frac{1}{2}$ miles above Bird Island Lighthouse, the width between the island and western shore is only 300 yards. The harbor is seldom used as an anchorage except by yachts; it is entered by a few vessels each year with cargoes of coal and lumber. The village of Sippican is on the west shore, about $2\frac{1}{2}$ miles above Bird Island Lighthouse; it is in the township of Marion.

The depth of water in the channel to Nye Wharf, about $\frac{1}{2}$ mile below the "Lower Village," is 12 feet, and to the anchorage off the village 7 feet at mean low water. About 9 feet can be taken to the "Upper Village," at the head of navigation, on high tides. The greatest draught entering the harbor is about 10 feet.

Pilots are generally taken by strangers bound up to the village; they may be had by signaling at the entrance to the westward of Bird Island. If necessary vessels may anchor in the entrance of the harbor until boarded by a pilot. Pilotage is not compulsory for coasting vessels (see Appendix I).

Towboats are seldom used; one may be had by telegraphing to New Bedford.

Tides.—The mean rise and fall of tides is 3.9 feet, corrected establishment 7^h 56^m.

Ice.—The harbor is usually closed to navigation for a month or more each winter.

SAILING DIRECTIONS, SIPPICAN HARBOR.

The following directions are good for vessels of 12 feet or less draught to an anchorage in 14 feet water about $1\frac{1}{2}$ miles above Bird Island Lighthouse, and are good for vessels of less than 6 feet draught to the anchorage off the village of Sippican. Some local knowledge is necessary to keep vessels in the best water up to the village; strangers should not attempt to enter at night.

* Shown on charts 349, scale $\frac{1}{20,000}$, price \$0.20; 112, scale $\frac{1}{40,000}$, price \$0.50.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 89,90, and when abreast Mattapoisett Harbor haul more to the northward and steer for Bird Island Lighthouse, keeping it bearing a little to the northward of **NE**. When about 1 mile from the lighthouse steer **N.** so as to leave the lighthouse about $\frac{3}{4}$ mile on the starboard hand and the western point at the entrance about $\frac{3}{8}$ mile on the port hand. When Bird Island Lighthouse bears **E SE. $\frac{1}{2}$ E.**, steer **N. by W. $\frac{3}{4}$ W.**; pass about 100 yards to the eastward of Seal Rocks buoy (black, No. 1) and anchor about $\frac{3}{8}$ mile to the northward or northeastward of the buoy in 14 feet of water, soft bottom.

If of less than 6 feet draught and bound to the village, continue the **N. by W. $\frac{3}{4}$ W.** course for the end of Nye Wharf, passing close to the eastward of Black Rock buoy (black, No. 3); leave red buoy No. 2 on the starboard hand. From this buoy steer about **N.** so as to leave black buoy No. 5 close to on the port hand and anchor off the village to the eastward of that buoy.

Remarks.—When approaching the entrance care should be taken to avoid The Bow Bells, which is marked by a buoy nearly $1\frac{1}{4}$ miles **SW. by W.** from Bird Island Lighthouse, and should be left on the port hand. The large summer house and stone wharf near the southern end of Blake Point are conspicuous when entering. At low water rocks and boulders will be seen along the eastern shore of Blake Point and some distance from it. Black buoy No. 1 marks the eastern end of the shoals, which lie beyond the rocks.

On the **N. by W. $\frac{3}{4}$ W.** course **Ram Island**, high and thickly wooded, will be on the starboard bow; black buoy No. 3, to the westward of the island, should be nearly ahead. Passing to the eastward of this buoy, **Little Island** a small island, about 100 yards from the western shore with a cluster of trees on it, should be ahead, and red buoy No. 2 a little on the starboard bow. The currents are sometimes quite strong in this part of the channel. When passing to the eastward of Little Island two black buoys will be seen to the northward. The anchorage is to the eastward of the lower buoy, taking care to avoid, small detached rock with 9 feet of water over it lying 200 yards **N NE. $\frac{1}{2}$ E.** from the northeastern end of Little Island.

Bird Island Lighthouse should be given a berth of at least $\frac{3}{4}$ mile. A small detached 12-foot shoal lies $\frac{1}{2}$ mile **SW. $\frac{3}{4}$ W.** from the lighthouse.

The southern and eastern shore of Blake Point should be given a berth of $\frac{1}{2}$ mile. The channel abreast **Ram Island** is narrow and has a number of unmarked dangers; these can be avoided by closely following the directions or by studying the chart.

WAREHAM RIVER *

empties into the northwestern end of Buzzards Bay, the entrance lying $3\frac{1}{2}$ miles, to the northward of Bird Island Lighthouse and $3\frac{1}{4}$ miles **NW. by N.** from Wings Neck Lighthouse. The river is the approach to the town of Wareham, situated on the west bank at the head of navigation, nearly 2 miles above its mouth. Off the entrance and in the river are extensive shoals and numerous ledges, through which a narrow but well buoyed channel leads from the deep water of the bay to the wharves of the town. Under the supervision of the U. S. Engineers improvements are in progress to obtain a channel 250 to 350 feet wide and 10 feet deep at low water, from **Long Beach** to the town. There is no anchorage in the river except in the channel, but vessels waiting for a fair wind or tide usually anchor off the mouth of the river to the northeastward of Great Hill.

The town of **Wareham** has extensive iron manufactories. The deepest draught of vessels trading here is about 12 feet. The depth of water in the channel is 9 feet at mean low water. There is from 5 to 10 feet of water at the wharves.

Pilots are necessary for vessels of over 9 feet draught and should be taken by all strangers. They may be obtained by making signal when off Bird Island Lighthouse or at anchor off Great Hill. Pilotage is not compulsory for coasting vessels.

Towboats are usually employed by the larger vessels, especially in winter. They may be ordered from New Bedford by telegraph, or telephone at Wareham.

Supplies.—Coal, water, provisions and ship chandler's stores can be had at Wareham.

Tides.—The mean rise and fall of tides is 4.1 feet; corrected establishment 8^h.

Tidal currents.—The velocity of currents is not great enough to materially interfere with a vessel having a good breeze. During the first half of the ebb the current sets across the flats below the wharves of the town, to the westward of the channel; and during the whole of the ebb it sets across the flats below **Long Beach**, at the mouth of the river, to the eastward of the channel.

Ice.—The river is closed part of each winter by ice.

SAILING DIRECTIONS, WAREHAM RIVER.

The following directions lead to the anchorage off Great Hill, above which no stranger should go without a pilot:

Approaching and to an Anchorage off Great Hill.—Follow the directions for Buzzards Bay, pages 89, 90, and when Bird Island Lighthouse bears **W NW.** distant about 1 mile, steer **N. $\frac{1}{2}$ W.**, keeping the

* See footnote on page 96.

eastern end of Great Hill on the port bow. Pass about 250 yards to the eastward of the eastern end of Great Hill then haul more to the westward and pass close to the westward of red buoy No. 14. This buoy will not be seen until nearly abreast the large hotel on the eastern point of Great Hill. When past this buoy haul up to N. $\frac{1}{2}$ W. again with a tall white church spire ahead. Anchor in 12 to 14 feet of water before reaching the buoys off Cromeset Neck, which will be seen ahead.

Remarks.—On the N. $\frac{1}{2}$ W. course Great Hill, a high wooded headland, with a cleared space and large hotel on its northeastern end, should be kept on the port bow; the eastern shore of Sippican Neck should be given a berth of $\frac{1}{2}$ mile. A black buoy off the southeastern end of Great Hill will be left well on the port hand.

Dangers.—Bird Island Reef makes about $\frac{1}{2}$ mile to the eastward from Bird Island, and is part of the shoal making to the southeastward and eastward from Sippican Neck. It has depths of 4 to 6 feet over it and is marked off its eastern end by a buoy (black, No. 13).

Dry Ledge, showing bare at low water, lies $\frac{1}{2}$ mile to the eastward of Great Hill and extends in a northerly direction for nearly 1 mile; **Little Bird Island**, a small bare rock, is near its northern end. The southern end of the ledge is marked by a buoy (red, No. 12), which lies about $1\frac{1}{4}$ miles NW. $\frac{1}{2}$ N. from Wings Neck Lighthouse.

Wings Cove Flats extend to the southward and eastward from the southeastern point of Great Hill, and are marked off their end by a buoy (black, No. 15).

Great Flats is an extensive shoal extending to the southward from the eastern side of the entrance to Wareham River. The southern end of this shoal is about 600 yards to the northeastward of the northeastern end of Great Hill, and is marked by a buoy (red, No. 14).

Weweantic River Flats make to the eastward from the southern side of the entrance to Weweantic River, and are marked by a buoy (black, No. 17).

BACK RIVER, ONSET BAY, MONUMENT RIVER, COHASSET NARROWS, AND BUTTERMILK BAY *

are unimportant waters at the northeastern end of Buzzards Bay, the common entrance to which lies between Wings Neck and the neck of land to the northward which is marked by **Tempes Nob**, a high and prominent hill. The indentation, of which the above named waters are a part, is very irregular in outline, includes a large number of bights, coves, and shallow streams, whose channels are all obstructed by shoals and other dangers.

There are two principal channels after passing the common entrance, the dangers of which are nearly all buoyed. The western channel leads with a least depth of 12 feet to an anchorage in Onset Bay. The eastern channel leads past Back and Monument rivers to the entrance to Cohasset Narrows, which in turn leads to Buttermilk Bay. The least depth in the channel to Monument and Back rivers is 9 feet, to Cohasset Narrows 6 feet.

There is very little trade by water to any of the villages on these waters, and few vessels enter them. A stranger should not attempt to enter without a pilot.

POCASSET HARBOR AND RED BROOK HARBOR.*

These two unimportant harbors lie to the southeastward of Wenaumet (Wings) Neck and to the northeastward of Scraggy Neck, and their common approach is between the two. **Bassetts Island**, low, narrow, and of very irregular shape, separates the two harbors, Pocasset Inner Harbor lying to the northward of this island, and Red Brook Harbor to the eastward. To the westward of the western end of Bassetts Island is a good anchorage in 15 to 26 feet, known as Pocasset Outer Harbor.

Pocasset Inner Harbor is entered through a narrow passage to the northward of the western end of Bassetts Island. About 12 feet can be taken into the inner harbor.

Red Brook Harbor is very shallow, having 3 to 8 feet of water, and is entered around the southern end of Bassetts Island. Only about 4 feet can be taken into the harbor.

The village of **North Pocasset** lies near the eastern end of Pocasset Inner Harbor, and the village of **South Pocasset** near the southeastern extremity of Red Brook Harbor.

Pilots are not necessary for making an anchorage in Pocasset Outer Harbor. If desiring a pilot for the Inner Harbor one may be had by making signal when off Wings Neck Lighthouse, or after anchoring in the Outer Harbor.

Tides.—The mean rise and fall of tides is 3.8 feet; corrected establishment 7^h 59^m.

SAILING DIRECTIONS, POCASSET HARBOR.

The following directions are good for vessels of not more than 14 feet draught to the anchorage in the outer harbor, where there is good holding ground in 15 to 26 feet of water.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 89, 90, and when Wings Neck Lighthouse bears NE. by E. steer for it. When the Lighthouse is $\frac{1}{2}$ mile distant ahead, steer E. $\frac{1}{2}$ N. and anchor when it bears about NW.

* Shown on chart 112, scale $\frac{1}{80,000}$, price \$0.50.

POCASSET HARBOR—DANGERS.

Remarks.—When heading for Wings Neck Lighthouse on the NE. by E. course, Southwest Ledge (north part) buoy (red, No. 10) should be left $\frac{1}{2}$ mile on the starboard hand. On the E. $\frac{1}{2}$ N. course the lighthouse should be left $\frac{1}{2}$ mile on the port hand. The water near the northern part of the harbor is quite bold and the shore can be approached as close as 200 yards with 14 feet water.

Dangers.—Southwest Ledge lies about $\frac{1}{2}$ mile to the westward of Scraggy Neck (the wooded point which separates Cataumet Harbor from Pocasset Outer Harbor) and is about $\frac{1}{2}$ mile long in a general N. by E. and S. by W. direction and is awash in several places at low water. The southwestern part of the ledge, which lies a little over $1\frac{1}{2}$ miles SSW. from Wings Neck Lighthouse, and the northwestern end, lying about $\frac{1}{2}$ mile SW. by S. from the lighthouse are marked by buoys (red, Nos. 8 and 10 respectively). The passage between Scraggy Neck and the ledge is unsafe for a stranger.

A bar with depths of 15 to 17 feet over it extends from the end of Wenaumet Neck to the southward across the entrance to the outer harbor. A small spot with 12 feet of water over it lies about $\frac{1}{2}$ mile SW. by W. from the northwestern end of Bassett's Island.

The eastern part of the harbor, between Bassett's Island and Scraggy Neck, is shoal.

CATAUMET HARBOR, WILD HARBOR, HOG ISLAND HARBOR, AND QUAMQUISSET HARBOR.*

These are all small and unimportant harbors on the eastern side of Buzzards Bay, and have but little trade.

Cataumet Harbor is south of Scraggy Neck and has its entrance about $1\frac{1}{2}$ miles S. by E. from Wings Neck Lighthouse. The channel into the harbor is buoyed, and a draught of 9 feet can be taken well into the harbor to an anchorage in 15 to 19 feet of water.

Wild Harbor, a small cove about $\frac{1}{2}$ mile to the southward of the entrance to Cataumet Harbor, has a depth of about 15 feet, and furnishes a good anchorage during northerly or easterly winds. It may be entered without danger by keeping about midway between its northern and southern points of entrance.

Hog Island Harbor, 2 miles S. of Wild Harbor, has a depth of only about 5 feet at its entrance, is not buoyed, and strangers should not attempt to enter it.

Quamquisset Harbor, a very small harbor lying about 1 mile to the northeastward from the northern entrance to Woods Holl, is small and has a narrow, crooked channel. There is about 7 feet of water in the channel, and although the most important dangers are buoyed a stranger should not attempt to enter.

CUTTYHUNK HARBOR*

is in the south side of Buzzards Bay, near the western entrance, and is formed by a bight between the eastern end of Cuttyhunk and western end of Nashawena Island. It is about $\frac{1}{2}$ mile wide, and affords anchorage in 12 to 24 feet water, but is exposed to northeasterly winds. To the northward of the harbor are Penikese and Gull islands and a number of ledges, which shelter it from that direction. The shores on both sides of the harbor are foul, and the anchorage is in the middle; it is sometimes used by weather-bound coasting vessels and fishermen. The principal dangers are marked by buoys, and the approach from the westward is marked by Cuttyhunk Lighthouse (see table, page 14), which is near the western end of the island.

SAILING DIRECTIONS, CUTTYHUNK HARBOR.

Strangers should not enter except in the daytime with clear weather and a fair wind. If entering from the westward a greater draught than 15 feet should not be taken in.

1. **Approaching and Entering from the Eastward.**—When to the westward of Quicks Hole steer W. by S. for the northern end of Cuttyhunk Island, giving the northern shore of Nashawena Island a berth of about $\frac{1}{2}$ mile. When near the western end of the island several buoys will be seen ahead. Steer so as to pass about midway between the north shore of the island and the first buoy (black, No. 5), and when the buoy bears about NE. by N. steer SW. by S. and anchor in the middle of the harbor to the eastward of red buoy No. 6.

Remarks.—When approaching from the eastward Penikese and Gull islands should be on the starboard bow; care should be taken to avoid Lone Rock, which lies about $\frac{1}{2}$ mile to the northward from the northeastern end of Nashawena Island. Black buoy No. 5 marks the southern end of a rocky ledge making to the southward from Gull Island. The eastern point at the entrance and the eastern shore of the harbor should be given a berth of over 350 yards. Two red buoys will be seen over towards the western shore of the harbor. The best anchorage is to the eastward of the southernmost red buoy.

* See footnote on page 99.

1 A. *Approaching and Entering from the Westward.*—Steer for Cuttyhunk Lighthouse, bearing between E. $\frac{1}{2}$ N. and SE. by S. and pass about $\frac{1}{2}$ mile to the northward of it. When the lighthouse bears S. distant $\frac{1}{2}$ mile, steer E NE. for black buoy No. 1, which should be made ahead. Leave this buoy about 30 yards on the port hand and steer about E. $\frac{1}{4}$ S., heading for black buoy No. 3. Leave the red and black horizontal striped buoy marking Middle Ledge on the starboard hand, and when it is passed haul a little to the southward so as to leave black buoy No. 3 about 100 yards on the port hand. When this buoy is well abaft the port beam steer about S., leaving the buoys on the western side of the harbor well on the starboard hand. Anchor to the eastward of the southernmost red buoy in 14 to 19 feet water, soft bottom.

Remarks.—In approaching Cuttyhunk Lighthouse between the bearings given, Sow and Figs Reef is left on the starboard hand and Ribbon Reef on the port hand. On the E NE. course the northern end of Gull Island will be ahead and the northeastern end of Cuttyhunk Island will be given a berth of about 600 yards. Care should be taken not to mistake the buoys, which are rather close together; black buoy No. 1 should appear as the nearest and farthest to the northward.

On the E. $\frac{1}{4}$ S. course for black buoy No. 3, another black buoy (No. 5) will be seen about $\frac{1}{2}$ mile farther to the eastward. The buoys marking detached rocks and ledges will be seen to the southward; when standing to the southward for the anchorage these should be left well on the starboard hand.

Dangers.—Lone Rock is described on page 88, and Sow and Figs on page 90.

Shoal water extends from Penikese Island to Gull Island, and no attempt should be made to pass between them.

Shoals extend out about $\frac{1}{2}$ mile to the northeastward from Cuttyhunk Island, **Whale Rock** and **Pease Ledge** being the names given to the shoaler parts. A detailed description of the dangers would be of but little use as vessels, must be guided mainly by the buoys.

WESTPORT HARBOR*

is the name given to the small anchorage just inside the mouth of Westport River (formerly known as Acoakset River). This river empties into the northern part of the large bight between Gooseberry Point and Sakonnet Point. The entrance is about $4\frac{1}{2}$ miles N NW. $\frac{1}{2}$ W. from Hen and Chickens Light-vessel and NE. by E. $\frac{1}{2}$ E. from the dry rocks to the southward of Sakonnet Point.

About 1 mile above its mouth Westport River divides into two branches, East Branch and West Branch, which have narrow and shallow channels and are only navigated by small vessels.

Westport River has a narrow and crooked channel with a depth of 8 feet up to the village of Westport Point, which is about $1\frac{1}{2}$ miles above its mouth, on the point of land between the two branches. The channel is well marked by buoys and can be readily followed in the daytime with a fair wind.

In southerly gales a heavy sea breaks on the bar at the entrance, making it unsafe to enter the harbor.

About 9 feet can be taken into the entrance of the harbor at low water, and 9 to 10 feet is the deepest draught that can be taken to the village at high water. There is 10 feet of water alongside some of the wharves.

Strangers entering the harbor generally take a pilot, lying off and on to the eastward of Two Mile Rock with signal set until boarded by one. Vessels should not attempt to enter at night. On the western side of the entrance is a peculiar rounded knubble, about 30 feet high, on which a flagstaff is erected, which serves as a guide to the entrance.

Tides.—The mean rise and fall of tides is 3.1 feet; corrected establishment, 7^h 58^m.

The tidal currents set in and out of the entrance with considerable velocity, and should be allowed for.

SAILING DIRECTIONS, WESTPORT HARBOR.

The following directions are good at low water and with a smooth sea and fair wind for vessels of 8 feet draught :

1. *Approaching and Entering from the Eastward.*—Bring Hen and Chickens Light-vessel to bear E. by S., distant about 1 mile, and steer N. by W. $\frac{1}{4}$ W. Leave Lumber Rocks buoy (red, No. 2) about $\frac{3}{4}$ mile on the starboard hand and Two Mile Rock buoy (black, No. 1) and spindle (black, with spherical cage on top), about $\frac{1}{4}$ mile on the port hand. Continue this course until the flagstaff on the knubble, at the western side of the entrance, bears about NW. Steer for the flagstaff on this bearing; pass 150 yards to the southward of red buoy No. 4, and then steer about N. by W. Leave Half Mile Rock, small bare rock, about 150 yards on the port hand, and haul to the westward, keeping the red buoys on the starboard hand. Anchor when inside the entrance and before reaching the black buoy on the Middle Ground.

*Shown on chart 113, scale $\frac{1}{80,000}$, price \$0.50.

From Vineyard Sound Light-vessel steer **N.** by **W.** $\frac{1}{2}$ **W.**; pass about 1 mile to the westward of Hen and Chickens Light-vessel and follow the directions above.

Remarks.—The bight to the eastward and northeastward of Two Mile Rock spindle is free from dangers, and the shore can be approached as close as 400 yards, but the western side of Gooseberry Neck is foul, and should be given a berth of over $\frac{1}{2}$ mile. Close attention should be given the buoys, which are the best guides for a stranger.

Dangers.—There are numerous rocks and shoals around Gooseberry Neck and along the shore from Westport entrance to Sakonnet Point, and only the most important are described.

Hen and Chickens is the name given to the group of bare rocks lying nearly 1 mile **S.** by **E.** $\frac{1}{2}$ **E.** from the southern end of Gooseberry Neck. From these rocks shoal water extends to the northward to and along the eastern side of Gooseberry Neck.

Old Cock is a bare rock lying $1\frac{1}{2}$ miles **S.** of the southern end of Gooseberry Neck. The rock is surrounded by shoal water and is marked by an iron spindle (black, 36 feet high, open-work cage) on it, and by a buoy (black, No. 1) a little to the southward of it.

Young Cock is another rock lying a few hundred yards to the northwestward of Old Cock, on the same shoal ground.

Lumber Rock, with 5 feet of water over it, lies nearly $\frac{3}{4}$ mile **SW.** $\frac{1}{4}$ **W.** from the southern end of Gooseberry Neck, and is marked by a buoy (red, No. 2) on its southern side. Shoal water extends from this rock to Gooseberry Neck and $\frac{1}{2}$ mile to the northwestward to Browning Ledge, which has 6 feet of water over it.

Half Mile Rock is a bare rock lying close to the southward of the channel into Westport Harbor.

Two Mile Rock lies a little over 1 mile **SSE.** from The Nubble, and is marked by an iron spindle (black, 35 feet high, spherical cage on top) and a buoy (black, No. 1) 400 yards to the southward of spindle.

Joe Burris Ledge, with 13 to 17 feet over it, lies about midway between Half Mile Rock and Two Mile Rock.

1 A. *Approaching and Entering from the Westward.*—Passing about 1 mile **S.** of Sakonnet Lighthouse and $\frac{1}{2}$ mile **S.** of Schuyler Ledge buoy (red, No. 2), steer **ENE.** $\frac{5}{8}$ **E.** about $6\frac{1}{2}$ miles. Leave Elisha Ledge buoy (red and black horizontal stripes) $\frac{3}{4}$ mile on the starboard hand and pass $\frac{1}{2}$ mile to the southward of Two Mile Rock buoy (black, No. 1). When this buoy is well abaft the port beam, steer **N.** so as to pass about 400 yards to the eastward of the buoy and the spindle to the northward of it. Continue the **N.** course until the flagstaff on The Knubble bears about **NW.** and follow the directions in section 1, preceding.

Remarks.—The bight to the northward of the sailing line has many unmarked dangers and vessels should not stand to the northward until the buoy on Two Mile Rock has been passed.

On the **ENE.** $\frac{1}{2}$ **E.** course the opening between Gooseberry Neck and Horse Neck Beach will be ahead. See also the remarks under section 1, preceding.

Dangers.—**Two Mile Ledge** extends, from the western side of Westport entrance, 1 mile in a southerly direction. It is about 200 yards wide, has a spot with only 3 feet of water over it near its southern end and 6 to 10 feet to the northward of this spot; 6 to 7 fathoms of water on its western side and $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms on its eastern side. Several spots with 8 to 9 feet lie between the ledge and Two Mile Rock.

Palmer Ledge, **Briggs Ledge**, and **Churches Ledge** lie from $\frac{1}{2}$ to $1\frac{1}{2}$ miles to the westward of Two Mile Ledge, and the shore should in this vicinity be given a berth of $1\frac{1}{2}$ miles. Farther to the westward the shore may be approached to within $\frac{1}{2}$ mile, being careful to avoid Elisha Ledge and Schuyler Ledge, which lie farther off shore and are described in connection with the sailing directions for approaching Sakonnet River.

SAKONNET RIVER*

is the name given to the body of water which leads to the northward between the mainland on the east and Rhode Island on the west. It is about 12 miles long and forms an approach from the sea to Mount Hope Bay and from it to points in the northern part of Narragansett Bay. The entrance, which is marked by Sakonnet Lighthouse (see table, page 14) on its eastern side, is 18 miles **NW.** by **W.** $\frac{1}{2}$ **W.** from Gay Head and $13\frac{1}{2}$ miles **ENE.** $\frac{1}{2}$ **E.** from Point Judith; between Sakonnet Point on the east and Sachuest Neck on the west it is about $2\frac{1}{2}$ miles wide and has comparatively few dangers. Above the entrance its width gradually diminishes for 5 miles until up to Fogland Point, where it is about $\frac{1}{2}$ mile; above the point for a distance of $2\frac{1}{2}$ miles the width is $1\frac{1}{2}$ miles; it then contracts to a width of $\frac{1}{2}$ mile and is crossed by a stone bridge having a draw 40 feet wide. Nearly $\frac{1}{2}$ mile above this bridge is a railroad bridge with a draw 36 feet wide. Between these two bridges is a kind of basin in which the water level differs from the level outside as much as 2 feet at certain stages of the tide, causing dangerous currents through the draws of the bridges. Vessels passing through these draws usually do so at or near the time of slack water at the bridges. The river is little used except by fishing steamers and small vessels carrying coal and general freight to Tiverton Four Corners and Tiverton Stone Bridge, two villages in Tiverton township on the eastern shore, about 7 and 10 miles respectively, above Sakonnet Lighthouse. The least depth in the channel is 14 feet, found at the draws of the bridges. The channel for a distance of $7\frac{1}{2}$ miles above Sakonnet Point is good for a least depth of 20 feet and has few unmarked dangers; about $\frac{1}{2}$ mile above Fogland Point it contracts in width, leading between extensive shoals

* Shown on charts 353, scale $\frac{1}{40,000}$, price \$0.75; 113, scale $\frac{1}{80,000}$, price \$0.50.

up to the first bridge, the depth ranging from 3½ to 9 fathoms. Between the bridges the depth ranges from 5 to 10 fathoms and there are no dangers if a mid-river course is kept. Above the second (railroad) bridge 4 fathoms can be carried into Mount Hope Bay.

Anchorage.—There is good anchorage in 3½ to 4½ fathoms water just below **High Hill Point**, about 5 miles above Sakonnet Lighthouse and in northerly winds it is easier of access than Newport for vessels up to 20 feet draught, there being more room to work in. Though open to the southward a heavy sea seldom reaches as far as the anchorage, and in southeasterly gales the water is comparatively smooth inside the mouth of the river. Above Fogland Point, over towards the eastern shore, is an anchorage which is much used by fishermen seeking shelter. The depths on the flats range from 10 to 14 feet; in the channel the depth is about 5 fathoms. The river is, however, seldom used as an anchorage except in case of necessity.

The vessels trading to Tiverton Stone Bridge usually enter the river from Mount Hope Bay. In summer a small steamer makes trips from Providence to Sakonnet Point, stopping at intermediate landings.

Tides.—The mean rise and fall of tides at Sakonnet Point is 3.6 feet; corrected establishment 7^h 40^m.

SAILING DIRECTIONS, SAKONNET RIVER.

The following directions carry a least depth of 20 feet up to Fogland Point, and are good for steamers of 12 feet draught into Mount Hope Bay.

1. Approaching and Entering to Fogland Point from the Eastward.—Bring Hen and Chickens Light-vessel to bear **E. ½ S.** and steer **W. ½ N.**, or bring Vineyard Sound Light-vessel to bear **SE.** by **E.** and steer **NW.** by **W.** Pass at least 1 mile to the southward of Sakonnet Lighthouse, and when it bears **NNE.** steer **N. ½ E.** Pass a little over ¼ mile to the westward of the lighthouse and ¼ mile to the westward of red buoy No. 4, which is nearly 2½ miles above the lighthouse. When Black Point is on the port quarter, distant nearly ⅓ mile, steer **N.** by **W. ½ W.** until Sandy Point is on the port quarter, distant about 350 yards, then steer **NNE. ½ E.**

If desiring to anchor to the northward of Fogland Point. When the lower of the two wharves above Fogland Point bears **E.** steer for the wharf on this bearing, and anchor on the flats in 10 to 15 feet water when Fogland Point bears to the westward of **S.**

If desiring to proceed up the river, follow the directions in section 2.

Remarks.—Passing south of Sakonnet Lighthouse Schuyler Ledge buoy should be left ¼ mile on the starboard hand. In the summer there are usually a number of fishing buoys to the southward of Sakonnet Point, which should not be mistaken for the ledge buoy.

On the **N. ½ E.** course Fogland Point will be made ahead and **High Hill**, bold and dark, will be quite prominent about ¼ mile **S.** of Fogland Point. After passing Church Point, the point on the eastern shore 2½ mile above Sakonnet Lighthouse, the course leads midway between the eastern shore and **Black Point**, the point on the western shore, about 2 miles above Church Point.

On the **N. by W. ½ W.** course Sandy Point, low, with a strip of sand beach near its end, will be on the port bow. A red buoy will be seen on the eastern side of the channel to the northeastward of the point, but there is a shoal, with 15 to 18 feet over it, to the westward of the buoy, and to avoid it the course is laid close to Sandy Point.

The **NNE. ½ E.** course leads a little over ¼ mile to the westward of Fogland Point and clears the shoals making to the southwestward from it. When standing to the eastward for the anchorage the water shoals rapidly from 30 to 12 feet.

Dangers.—**Elisha Ledge**, a small detached pinnacle rock with 13 feet of water over it, lies 2 miles **SE.** by **E. ½ E.** from Sakonnet Lighthouse, and is marked by a buoy (red and black horizontal stripes), which should be given a berth of ¼ mile.

Schuyler Ledge, a small detached ledge, the outermost of the ledges to the southward of Sakonnet Point, has 8 feet of water over it and bears **S.** by **E. ½ E.** distant nearly ¼ mile from Sakonnet Lighthouse, and is marked off its south side by a buoy (red, No. 2).

Cormorant Ledge has 2 feet of water over it, lies a little over 2 miles **WNW. ½ W.** from Sakonnet Lighthouse and about ¼ mile to the southward of Cormorant Rock, and is marked by a buoy (black, No. 1) placed close to the southward of the ledge.

Cormorant Rock is a bare dark rock off the western side of the entrance to Sakonnet River, lying about ¼ mile **S.** by **W.** from Sachuest Point, the southern point of Sachuest Neck. Vessels should not pass between the rock and Cormorant Ledge.

Island Rocks, showing bare at low water, extend to the eastward about 500 yards from the northeastern side of Sachuest Neck.

Church Point Reef makes off about 900 yards in a southwesterly direction from Church Point. A group of bare rocks, known as the **Old Bull Rocks**, are near the southwestern end of the reef and are marked off their western side by a buoy (red, No. 4).

Smith Reef has a depth of 10 feet over it, lies about 900 yards **NE. ½ N.** from Flint Point, the northern point of Sachuest Neck, and is marked off its eastern side by a buoy (black, No. 3).

Shoals fill the bight to the westward of Flint Point and the bight between Black and Sandy points.

Shoals with 9 to 15 feet of water over them extend about 900 yards to the southward and southwestward from Fogland Point. A buoy (red, No. 6) is placed to the westward of a 9-foot spot lying about 600 yards SW. by S. from the southwestern end of the point.

McCurry Point Shoal has 5 feet of water near its outer end and extends about 650 yards in a southeasterly direction from McCurry Point, the point on the western shore about 1 mile above Fogland Point.

1 A. *Approaching and Entering from the Westward.*—From Brenton Reef Light-vessel steer E. by S.; or, from the whistling buoy off Point Judith, steer ENE. $\frac{1}{2}$ E. As soon as Sakonnet Lighthouse is made steer for it on any bearing between E. and N. Bring the lighthouse to bear E., distant $\frac{3}{4}$ mile, and steer N. by E., heading up the middle of the river. When well past Black Point, the point on the western shore about $2\frac{3}{4}$ miles above the northern point of Sachuest Neck, steer N. by W. $\frac{1}{2}$ W. and continue as directed in section 1, preceding.

Remarks.—When steering for Sakonnet Lighthouse, Cormorant Rock will be left at least $\frac{1}{2}$ mile on the port hand. The N. by E. course leads about $\frac{1}{2}$ mile to the eastward of Sachuest Neck and $\frac{1}{2}$ mile to the westward of Church Point. High Hill Point will be ahead; it appears as a high knubble, with steep faces to the westward, on the end of a low point. Two small hills on Fogland Point will show to the westward of High Hill Point. See also the remarks and dangers under section 1, preceding.

2. *From Fogland Point to Mount Hope Bay.*—Having followed the directions in sections 1 or 1A, preceding, continue the NNE. $\frac{1}{2}$ E. course past Fogland Point until Gould Island, which will show prominently, bears N. by E., when steer for it, keeping the bearing. As Gould Island is approached haul a little to the eastward so as to leave it about 250 yards on the port hand and then steer N. by E. for the draw of the stone bridge. From this bridge steer directly for the draw of the railroad bridge, about $\frac{3}{4}$ mile farther up, and when through the latter draw make good a N. by E. $\frac{1}{2}$ E. course into Mount Hope Bay.

If bound to Fall River, follow the eastern shore, giving it a berth of about $\frac{1}{2}$ mile until Spar Island (the small island in Mount Hope Bay) bears NW. by W., when haul closer in and give the shore a berth of only about 300 yards until up to the city.

If bound into Narragansett Bay, round Common Fence Point, the point about 1 mile above the second bridge, at a distance of at least $\frac{1}{2}$ mile, and then steer about SW. by W., heading midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse.

Remarks.—Vessels of 12 feet or less draught can easily follow the above directions without danger. The only trouble will be in passing through the draws of the bridges. The great difference of water level in that part of the river between the two bridges and that outside causes a very strong current, and makes the passing through the draws dangerous.

When the course is changed to N. by E. for Gould Island, McCurry Point should bear W. and the western edge of Fogland Point should bear S. Gould Island (small, round island, covered with a thick undergrowth) will show prominently.

Dangers.—The bight to the northward of Fogland Point has a depth of 9 to 15 feet, and the whole western half of the river between McCurry Point and the stone bridge is shoal, having a depth varying from 7 to 17 feet.

NARRAGANSETT BAY.*

The entrance to this bay is between Brenton Point, the southwestern point of Rhode Island on the east, and Point Judith Neck on the west. Sakonnet River, strictly speaking, may be regarded as a part of Narragansett Bay, but is treated under a separate heading (see page 102). Between Brenton Point and Narragansett Pier (at the northern extremity of Point Judith Neck) the entrance is about $4\frac{1}{2}$ miles wide, but above this the width of the bay varies from 3 to 6 miles, and appears somewhat irregular in shape on account of deep indentations and the existence of two large islands, Conanicut and Prudence, nearly in its center. The length of the bay, from the entrance to its northern extremity at the mouth of Providence River, is 16 miles. It is the approach by water to the cities of Newport, Providence, Fall River, and Taunton, and to a number of towns and villages, the most important of which are Bristol, Wickford, and Greenwich.

Conanicut Island, lying in the lower part of the bay near its entrance, is about $7\frac{1}{2}$ miles in length in a WNE. and SSW. direction, is irregular in shape, but has an average width of about 1 mile. Its surface is hilly and undulating, the greatest height being about 135 feet, and its shores are quite bold-to.

Prudence Island, in the northern part of the bay, is irregular in shape, about $5\frac{1}{2}$ miles long in a general NNE.

* Shown on charts A, scale $\frac{1}{1,200,000}$, price \$1.00; 113, scale $\frac{1}{80,000}$, price \$0.50; 333, scale $\frac{1}{40,000}$, price \$0.75; and in part on chart 353*, scale $\frac{1}{20,000}$, price \$0.50. See also footnote on page 2.

and S. W. direction, with a width varying from $\frac{1}{4}$ mile to $1\frac{1}{2}$ miles. It is composed of cleared and cultivated lands, with undulating outline, the cleared fields being diversified by occasional orchards and groves of trees. Near the center of the southern part of the island the land attains its greatest height, 160 feet, and the summit is crowned with a number of buildings and a large orchard.

Besides the two large islands described there are a number of small islands in the bay, which are sufficiently described in the remarks following the sailing directions.

The entrances to the bay are well marked by the lighthouses and **Brenton Reef Light-vessel** (see table, page 14), making entering easy in fair weather, and in thick weather if close attention be given to the fog signals.

The **Eastern Passage**, between Rhode Island on the east and Conanicut and Prudence islands on the west, has a least depth of about 10 fathoms in the channel for a distance of 12 miles above the entrance, and a depth of about $4\frac{1}{2}$ fathoms to Providence River entrance, but it requires some local knowledge to carry the latter depth above the entrance to Bristol Harbor. It is also the most direct passage to Newport, Bristol, Mount Hope Bay, and Taunton River.

The **Western Passage**, between Conanicut and Prudence islands on the east and the mainland on the west, is the approach to Dutch Island Harbor, Wickford, Greenwich, and Providence River. Vessels of over 18 feet draught rarely go above Dutch Island Harbor, but this draught can be taken to the head of the bay, although it requires some local knowledge to carry the best water when to the northward of Hope Island.

Prominent features and aids.—On the western shore, a little to the southward of Narragansett Pier—a much frequented summer resort—is a tall tower which can be seen nearly 20 miles on a clear day. **Point Judith Lighthouse**, a prominent mark for vessels standing along the coast and through the sounds, is $3\frac{1}{2}$ miles to the southwestward of this tower. It is the turning point for vessels coming from the westward and bound into the bay. The land on both sides of the entrance is hilly and on the eastern side are a number of large summer residences with extensive lawns. The southern end of **Conanicut Island**, which is in the middle of the entrance and separates the Eastern and Western passages, is marked by **Beavertail Lighthouse** (see table, page 14). **Castle Hill Lighthouse** is on the eastern side of the Eastern Passage and **Whale Rock Lighthouse** on the western side of the Western Passage. The passages are well marked by lighthouses, and the principal dangers by buoys, beacons, or spindles, so that the navigation of the bay is comparatively easy in clear weather.

Anchorage.—The principal anchorages for vessels seeking shelter from storms are Newport Harbor, in the Eastern Passage, and Dutch Island Harbor, in the Western Passage. These harbors afford anchorage with good holding ground for vessels of the deepest draught, and are used by coasting vessels on the passage between Vineyard Sound and Long Island Sound. Good anchorage will be found almost anywhere in the bay under the lee of the islands or the shore, and vessels becalmed or at night frequently anchor.

Pilots for Narragansett Bay and the harbors in Rhode Island will be found cruising between Point Judith and Cuttyhunk and also off Block Island. If a vessel passes into the bay without having been boarded by a pilot, one may be obtained at Newport or Dutch Island Harbor. Pilotage is compulsory for foreign vessels, or vessels from a foreign port (see pilot laws for the State of Rhode Island in Appendix I).

Towboats are frequently used by vessels in the bay, especially those bound to Providence by the Western Passage, and may sometimes be found off the entrance or in Newport Harbor. It is usual for vessels entering by the Western Passage to put into Dutch Island Harbor, and from there telephone to the towboat office at Providence.

Quarantine.—The quarantine laws for Rhode Island and Massachusetts govern the ports in the respective States. Local boards of health have the power to establish rules for the quarantine of their ports (see Appendix I).

Marine Hospital Service.—Seamen entitled to medical treatment are received, under an agreement with the U. S. Marine Hospital Service, at a hospital in Newport and one in Providence. (See extracts from the Regulations U. S. Marine Hospital Service, in Appendix III.)

Supplies.—Coal and water can be obtained at Newport, Providence, and Fall River, and provisions and ship chandler's stores at most of the towns on the bay or its tributaries.

Repairs to the hulls of vessels can be made at Fall River and Providence and to the machinery of steamers at Providence.

Wind signals of the U. S. Weather Bureau are displayed at Point Judith and Newport, and at several of the towns in the bay (see the table, page 20).

Fogs.—In the entrance to the bay and its approach fogs are more prevalent from April to October than during the rest of the year; they are brought in by winds from E. through S. to S. W., and are cleared off by northerly and westerly winds; their usual duration is 4 to 12 hours, but periods of 4 to 6 days have been known, with but short clear intervals. The head of the bay will sometimes be free from fog when the entrance is completely shut in.

Ice.—Navigation in the bay and its tributaries is sometimes impeded by floating ice, and in severe winters by pack or field ice. The ice breaking up in Providence River and Mount Hope Bay is set by N. and N. E. winds down the bay through the Eastern Passage, and if there is much ice a gorge is sometimes formed at Fort Adams, but is of short duration. The passages are rarely closed for any length of time below Gould Island in the Eastern, and Dutch Island in the Western passage. During January and February Mount Hope Bay, Bristol, Providence River,

Greenwich, Warren, and Wickford are usually closed to sailing vessels unaided by steam. The inner harbor of Newport is also sometimes closed during the same months with the exception of a channel kept open by the New York steamers.

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE EASTERN PASSAGE.

Note.—Approaching the entrance in thick weather, Brenton Reef Light-vessel should be made and passed close-to. From the light-vessel a stranger should be able to make the anchorage in Newport outer harbor by closely following the directions and paying attention to the fog signals.

1. Approaching and Entering from the Eastward.—Coming from Buzzards Bay bring Hen and Chickens Light-vessel to bear **E. $\frac{1}{2}$ S.** and steer **W. $\frac{1}{2}$ N.** about 16 miles, passing at least 1 mile south of Sakonnet Lighthouse; or, coming from Vineyard Sound, bring Vineyard Sound Light-vessel to bear **E SE.** and steer **W NW.** about 17 miles; or, passing about 1 mile south of No Mans Land, steer **NW. $\frac{1}{2}$ W.** about 27 miles. These courses all lead close to Brenton Reef Light-vessel; as soon as the latter is made it should be steered for, taking care, however, to keep it bearing to the northward of **W.** by **N.**

Pass on either side of Brenton Reef Light-vessel and bring it to bear **S.** by **W. $\frac{1}{2}$ W.** and steer **N.** by **E. $\frac{1}{2}$ E.** This course made good for 2 miles from Brenton Reef Light-vessel will lead to a point $\frac{1}{2}$ mile **NW.** from Castle Hill Lighthouse, and the course must then be changed to **NE.** by **E.** directly for Newport Harbor (Goat Island) Lighthouse.

Now, if bound into Newport Harbor, follow the sailing directions under that heading.

If bound up the bay, follow the directions in section 2, following.

If beating into the Eastern Passage.—To avoid Brenton Reef, when standing to the eastward go about as soon as Castle Hill Lighthouse bears **N.** by **E.** When well up to Castle Hill Lighthouse, to avoid Butter Ball Rock, pass to the westward of the bell buoy lying 300 yards to the westward of it. Above Castle Hill Lighthouse the eastern shore can be approached as close as 150 yards.

When standing to the westward care should be taken to avoid Newton Rock and the ledge making to the southward from Beavertail. The shore from Beavertail Lighthouse to the entrance of Mackerel Cove should be given a berth of about 400 yards to insure safety. The entrance of Mackerel Cove has deep water, but care must be taken to avoid Kettle Bottom Rock, which should in no case be approached closer than 150 yards from the southward. When well to the eastward of Kettle Bottom Rock give the shore a berth of at least 150 yards and keep this distance outside of a line drawn from one dry rock to another. Kettle Bottom Rock and the dangers off the north shore, between Fort Dumpling and Mackerel Cove, can be avoided by keeping Newport Harbor Lighthouse open and not permitting it to be shut out by Fort Dumpling.

Remarks.—When approaching the entrance the tall tower to the southward of Narragansett Pier will be a conspicuous mark on the port bow; if coming from Buzzards Bay it will be made ahead. In clear weather Brenton Reef Light-vessel may be left $\frac{1}{2}$ mile on the port hand, but in thick weather it should be passed close enough to hear the fog bell and get a bearing. When the light-vessel bears **S.** by **W. $\frac{1}{2}$ W.** astern on the **N.** by **E. $\frac{1}{2}$ E.** course, Castle Hill Lighthouse will be on the starboard bow; the lighthouse, and the bell buoy about 600 yards to the southwestward of it, should be left at least 150 yards on the starboard hand. Mackerel Cove, the long cove making into the southern side of Conanicut Island, will be opened on the port bow. The head of this cove is separated from Dutch Island Harbor by a low, narrow strip of beach over which the vessels at anchor in Dutch Island Harbor can sometimes be seen when standing in through the Eastern Passage.

When standing on the **NE.** by **E.** course for Newport Harbor (Goat Island) Lighthouse, Fort Adams, a large granite structure with sodded parapets, will be on the starboard bow. Fort Dumpling, a low circular stone tower, will be on the port bow. As the latter draws on a beam bearing, the stretch up the bay to the westward of Rose Island will be opened. The eastern shore above Castle Hill Lighthouse can be approached as close as 150 yards, but the northern shore, off the eastern side of the entrance to Mackerel Cove, should be given a berth of 500 yards; in the vicinity of Fort Dumpling the shore and bare rocks should not be approached closer than 200 yards.

Dangers.—**Seal Ledge,** a detached ledge with a least depth of 17 feet over it, lies about $\frac{1}{2}$ mile **S.** by **E. $\frac{1}{2}$ E.** from Brenton Point, and is marked at its southern side by a buoy (red, No. 2).

Seal Rock is a bare rock, surrounded by shoal water, lying $\frac{1}{2}$ mile **SE. $\frac{1}{2}$ S.** from Brenton Point.

Brenton Reef, showing bare in places at low water, extends about $\frac{1}{2}$ mile in a **SEW. $\frac{1}{2}$ W.** direction from Brenton Point, and is marked at its southern end by a buoy (red, No. 4).

Newton Rock has 3 feet of water over it, and is part of the ledge which extends about 400 yards to the southward from Beavertail, the southern end of Conanicut Island. A red and black horizontal striped bell buoy is placed about $\frac{1}{2}$ mile to the southwestward of the rock and about 300 yards from the southern end of the ledge.

Butter Ball Rock, a small bare rock about 150 yards from the southern end of Castle Hill, is marked off its western side by a red bell buoy which is a little over $\frac{1}{2}$ mile to the southwestward of Castle Hill Lighthouse.

Kettle Bottom Rock is on the northern side of the channel about 300 yards to the southeastward of the eastern point of the entrance to Mackerel Cove. The rock is always bare, and there are spots with 10 to 15 feet of water over them to the northeastward of it. The shore in this vicinity should be given a berth of 500 yards.

1 A. *Approaching and Entering from the Westward.*—When Point Judith Lighthouse is made, steer so as to pass about 1 mile to the southward of it and close to the whistling buoy. From the latter steer **NE.**, and when nearly up to Castle Hill Lighthouse haul a little to the northward so as to pass about $\frac{1}{4}$ mile to the northwestward of it, and then steer **NE.** by **E.** for Newport Harbor Lighthouse, and follow the directions in section 2, following. If bound into Newport Harbor follow the directions for that harbor.

See also the directions for beating into the Eastern Passage, under section 1.

In thick weather, from the whistling buoy off Point Judith steer **NE.** $\frac{1}{2}$ **E.** about $6\frac{3}{4}$ miles until close to Brenton Reef Light-vessel, then follow the directions in section 1, foregoing.

Remarks.—When standing on the **NE.** course from the whistling buoy off Point Judith, Brenton Reef Light-vessel will be made on the starboard bow and Beavertail Lighthouse on the port bow, and the course leads about midway between them. Castle Hill Lighthouse should be made nearly ahead. The Western Passage into Narragansett Bay will be open between Beavertail Lighthouse on the east and Whale Rock Lighthouse on the west. *If beating*, a good rule to follow is to go about when $\frac{1}{2}$ mile from the shore between Point Judith and Whale Rock. See also the remarks under section 1, preceding.

Dangers.—There are several detached spots with $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms of water over them lying from $\frac{1}{2}$ to 1 mile to the southward and southwestward from Point Judith. In heavy southerly gales the sea breaks on these spots.

The shore for a distance of $2\frac{1}{2}$ miles to the northeastward of Point Judith is foul and should be given a berth of $\frac{1}{2}$ mile. Abreast the tower it is quite bold-to, but abreast Narragansett Pier there are shoals and rocks which extend about 300 yards from the shore. There is a small detached, unmarked 14-foot spot about $\frac{1}{2}$ mile **E.** $\frac{1}{4}$ **N.** from the life-saving station at Narragansett Pier and $\frac{1}{2}$ mile **SW.** by **W.** from Whale Rock Lighthouse.

See also the dangers under section 1, foregoing.

2. *From abreast Fort Adams to Prudence Island Lighthouse.*—Having followed the directions in sections 1 or 1A preceding, when, on the **NE.** by **E.** course for Newport Harbor (Goat Island) Lighthouse, the outer bare rocks of The Dumplings are on the port beam and Rose Island Lighthouse bears **NNE.**, steer **N.** by **E.** When Gull Rocks Lighthouse bears **E.** by **S.** steer **NNE.** $\frac{1}{2}$ **E.** about $6\frac{1}{2}$ miles; Prudence Island Lighthouse should then bear on the port beam distant $\frac{1}{2}$ mile.

If bound to Fall River or Taunton, follow the sailing directions under the heading Mount Hope Bay and Taunton River.

If bound to Bristol, follow the sailing directions under the heading Bristol Harbor.

If bound to Warren River, Providence, or Rocky Point, follow the directions in section 3, following.

Remarks.—When the course has been changed from **NE.** by **E.** to **N.** by **E.**, Fort Adams will be on the starboard beam and the western edge of Gould Island should be ahead. The course leads "about 400 yards to the eastward of The Dumplings and 400 yards to the westward of Rose Island Lighthouse. Gull Rocks Lighthouse will be nearly abeam when past the northern end of Rose Island, and a number of buoys will be seen to the eastward of the sailing line. The village of Jamestown is on the eastern shore of Conanicut Island abreast Rose Island. The large buildings of the U. S. Training Station and Naval War College will show conspicuously on Coaster Harbor Island and at night the lights in the buildings and around the grounds will be plainly visible.

On the **NNE.** $\frac{1}{2}$ **E.** course Gould Island, lying in the middle of the Eastern Passage about $\frac{1}{2}$ miles above Rose Island, and Prudence Island, large hilly island, will be on the port bow. On the eastern side of Gould Island is the lighthouse, and on Sand Point, a small point on the eastern side of Prudence Island, is Prudence Island Lighthouse. Gould Island will be left nearly $\frac{1}{2}$ mile on the port hand, and while it is abeam the buoys of the U. S. Naval Compass Station will be on the starboard hand; to the southeastward of these buoys is Coddington Cove, a good anchorage in southerly and easterly winds. The passage between Conanicut and Prudence islands will be fully opened. Vessels in the Eastern Passage and bound to Wickford or East Greenwich pass through between the islands, carrying a depth of $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms. The sailing line passes nearly $\frac{1}{2}$ mile to the eastward of Halfway Rock spindle and about midway between Prudence Island and Dyers Island, the small island lying to the eastward of the southern end of Prudence Island. When nearly up to Prudence Island Lighthouse the entrance to Mount Hope Bay will be opened on the starboard bow and the western entrance to Bristol Harbor will be a little on the port bow; the head of the bay to Providence River entrance will be opened a little to the westward of Bristol Harbor entrance. The shore of Prudence Island, for a distance of $1\frac{1}{2}$ miles below the lighthouse, is bold-to and can be approached as close as 150 yards.

Dangers.—The Dumplings are a cluster of bare and sunken rocks lying off Bulls Point, the southeastern point of Conanicut Island. They are easily avoided by passing over 200 yards to the eastward of the rocks, which are out of water.

Rose Island North Shoal extends about 300 yards to the northward and 550 yards to the northeastward from the north end of Rose Island and has 9½ feet of water at its end. The northwestern end of the shoal is marked by a buoy (red, No. 6) and the northeastern end by a buoy (red, No. 8).

Bishop Rock Shoal, a small detached shoal with 8½ feet of water over it, lies about 300 yards to the westward of Bishop Rock the small bare rock about ¼ mile N. from Coasters Harbor Island. The shoal is marked off its western side by a buoy (red, No. 10).

The Sisters, a small rocky shoal which shows bare at low water, lies about 200 yards from the shore and about ¼ mile N. by E. ¼ E. from Bishop Rock. The western side of the shoal is marked by a buoy (red, No. 12).

Halfway Rock, a small ledge showing bare at its southern end, lies 1¼ miles NNE. ¼ E. from Gould Island Lighthouse and about ¼ mile SSW. from the southern end of Prudence Island. A spindle (black, cage on top) is on the bare part of the ledge.

Fiske Rock, a detached rock with 12 feet of water over it, lies ¼ mile NE. ¼ N. from the spindle on Halfway Rock and is marked by a buoy (red and black horizontal stripes). Strangers should not pass between the buoy and spindle.

Dyers Island Shoal, a part of which is bare at low water, extends nearly ½ mile to the southward and southwestward from Dyers Island, and is marked on its western edge by a buoy (red, No. 14). A bar, with 8 to 15 feet of water over it, extends to the southward from the buoy to the shore.

Coggeshall Ledge has 7 feet of water at its end, extends nearly ½ mile N. from Coggeshall Point, the point on the eastern shore 1¼ miles SE. by S. from Prudence Island Lighthouse, and is marked at its northern end by a buoy (red, No. 16).

3. From Prudence Island Lighthouse to Providence River Entrance.—When Prudence Island Lighthouse bears W., distant about ¼ mile, steer N. by E. about 1½ miles until Hog Island Shoal Light-vessel bears abeam; then steer N. by W. about 1¾ miles, passing a little more than ¼ mile to the westward of Popasquash Neck. When North Point (the northern point of Prudence Island) bears NW. by W. ¼ W. steer N. ¾ E. until Conimicut Lighthouse bears N NW. ¾ W., when steer for the lighthouse on this bearing until it is ¼ mile distant, then follow the sailing directions under the heading, Providence River.

If bound to Rocky Point steer N. by E. from Prudence Island Lighthouse as directed above, and when Hog Island Shoal Light-vessel bears abeam steer N NW. ¾ W. about 4½ miles, leaving the northern end of Prudence Island more than ½ mile on the port hand. When the wharf at Rocky Point bears W NW. steer for it and anchor in 15 feet water about 500 yards from its end.

If bound into Warren River follow the sailing directions under heading, Warren River.

Remarks.—On the N. by E. course Popasquash Neck will be ahead. Hog Island, the hilly island in the entrance to Bristol Harbor and the western entrance to Bristol Harbor, will be on the starboard bow. When the course is changed to N. by W. the red buoy marking the southwest point of Hog Island Shoal should be ¼ mile on the starboard beam.

The N. by W. course leads directly for Conimicut Lighthouse and the buoy marking Ohio Ledge; it requires very clear weather to see either in the daytime. On this course, when north point of Prudence Island bears NW. by W. ¼ W., the highest part of Popasquash Neck will be on the starboard beam.

On the N. ¾ E. course, the buoy on Ohio Ledge will be made on the port bow; to carry the best water it should be left nearly ¼ mile on the port hand. The entrance to Warren River will be opened on the starboard bow and the old white light-tower on Nayat Point and Conimicut Lighthouse will be well on the port bow.

On the N NW. ¾ W. course care should be taken to keep close on the bearing so as to carry more than 25 feet of water. Vessels desiring a towboat for Providence River can anchor in 5 to 8 fathoms water about ½ mile to the southeastward of Conimicut Lighthouse.

Dangers.—Hog Island Shoal has 3 to 11 feet of water over it, and extends about ½ mile to the southward and southwestward from Hog Island. The southwestern end of the shoal is marked by a buoy (red, No. 20).

A shoal with 7 to 14 feet of water over it makes off nearly ½ mile from the shore of Prudence Island abreast Hog Island. Mount Tom Rock, bare at low spring tides, is on this shoal and lies about 350 yards from the shore of Prudence Island. A buoy (black, No. 5) is placed on the eastern edge of the shoal 400 yards to the eastward of the rock.

Popasquash Point Shoal makes to the southward about 400 yards from the point, and is marked at its southeastern end by a buoy (black, No. 1).

Shoals make off nearly ½ mile from the eastern shore of Prudence Island from 1¼ miles above the lighthouse to its northern end.

The western shore of Popasquash Neck can be approached as close as 250 yards with 3½ fathoms water.

A shoal with a depth of about 10 feet over it makes to the northward a little over ¼ mile from the north point of Prudence Island, and is marked near its northern end by a buoy (red and black horizontal stripes).

Ohio Ledge, a small ledge with 8 feet of water over it, lies 1¼ miles NE. by E. from the north point of Prudence Island, and 2¼ miles S. by E. ¼ E. from Conimicut Lighthouse. The ledge is near the southeastern end of an extensive shoal, with 15 to 17 feet of water over it, which extends nearly 1 mile to the northward; it is marked near its southern end by a buoy (red and black horizontal stripes).

Shoals, having depths of 9 to 18 feet over them, fill the bight between Warren River entrance and Nayat Point, the eastern point at entrance to Providence River. These can be avoided by keeping Conimicut Lighthouse bearing to the northward of NW. ¼ N. until within ¼ mile of it.

Conimicut Middle Ground is the extensive shoal which makes off 1 mile from the shore south of Conimicut Point. The depths on this shoal range from 2 to 15 feet and the bottom has many rocky patches. On the eastern edge of the Middle Ground, and about $\frac{1}{2}$ mile S. $\frac{1}{2}$ E. from Conimicut Lighthouse, is a buoy (black, No. 9).

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE WESTERN PASSAGE.

The least depth on the sailing lines as far as the anchorage off Wickford is $4\frac{1}{2}$ fathoms, and 17 feet as far as Providence River entrance.

1. Approaching and Entering from the Eastward.—Follow the directions in section 1, page 106, until up to Brenton Reef Light-vessel. Pass on either side of the light-vessel, bring it to bear SE. by E., and steer NW. by W. When Beavertail Lighthouse bears NE. make good a N. by E. course directly for Dutch Island Lighthouse, and when nearly up to it proceed as directed in section 2 following.

If bound into Dutch Island Harbor follow the directions under that heading.

Remarks.—Approaching Brenton Reef Light-vessel be guided by the remarks under section 1, page 106. The NW. by W. course leads a little over $\frac{1}{2}$ mile to the southward of Beavertail Lighthouse and nearly $\frac{1}{2}$ mile south of the bell buoy off Newton Rock; Whale Rock Lighthouse will be on the port bow. When abreast the bell buoy, the Western Passage will be opened and Dutch Island Lighthouse will be seen to the northward.

The deep water channel from Beavertail to Dutch Island is over $\frac{1}{2}$ mile wide, but the depth is variable, ranging from $4\frac{1}{2}$ to 10 fathoms.

Dangers.—Newton Rock, to the southward of Beavertail, is described on page 106.

Whale Rock, on the western side of the entrance to the Western Passage, is marked by Whale Rock Lighthouse, which bears W. $\frac{1}{2}$ S. distant $1\frac{1}{2}$ miles from Beavertail Lighthouse. There is a 7-foot spot about 200 yards to the northward of Whale Rock Lighthouse. A channel with a depth of about 8 fathoms leads between the lighthouse and the western shore, but strangers should not use it.

Jones Ledge, a small detached rocky spot with 9 feet of water over it, lies on the western side of the channel about 1 mile NNE. from Whale Rock Lighthouse. The eastern side of the ledge is marked by a buoy (red and black horizontal stripes).

Austin Hollow, the bight in the western shore of Conanicut Island about 1 mile to the northward of Beavertail, is full of shoals, but the shore of the island above the bight to the entrance of Dutch Island Harbor can be approached as close as 200 yards.

A 17-foot spot lies about 350 yards from the western shore and a little over $\frac{1}{2}$ mile SW. $\frac{1}{2}$ W. from Dutch Island Lighthouse. The western shore between Bonnet Point and South Ferry should be given a berth of 400 yards.

1 A. Approaching and Entering from the Westward.—Pass about 1 mile S. of Point Judith Lighthouse, and from the whistling buoy steer NE. by N. about 7 miles, heading fair between Beavertail and Whale Rock lighthouses. When Beavertail Lighthouse bears on the starboard beam, distant $\frac{1}{2}$ mile, steer N. by E. $\frac{1}{2}$ E., heading for Dutch Island Lighthouse, and when nearly up to it proceed as directed in section 2, following.

If bound into Dutch Island Harbor follow the directions under that heading.

Remarks.—On the NE. by N. course the entrance to the western passage will be ahead, Whale Rock Lighthouse a little on the port bow, and Beavertail Lighthouse on the starboard bow.

At night a careful study of the characteristics of the lights is necessary, as a number of the lights marking the Eastern Passage will be seen on the starboard bow. The course leads about $\frac{1}{2}$ mile to the southeastward of Whale Rock Light and gives the shore between Point Judith and the light a berth of at least $\frac{1}{2}$ mile.

On the N. by E. $\frac{1}{2}$ E. course the southern entrance to Dutch Island Harbor will be open just to the eastward of Dutch Island Lighthouse, and the passage up the bay to the westward of it.

See the remarks and dangers under section 1 A, page 107, and for the dangers above Whale Rock Lighthouse see the dangers under section 1, preceding.

2. From Dutch Island Lighthouse to Providence River Entrance.—Having followed the directions in sections 1 or 1 A until Dutch Island Lighthouse is $\frac{1}{2}$ mile distant ahead, haul more to the northward and westward, steering so as to leave the lighthouse and island about $\frac{1}{4}$ mile on the starboard hand. When the northern end of Dutch Island is abeam steer NE. by N. until Dutch Island Lighthouse bears S. by W. $\frac{1}{2}$ W., then with it over the stern make good a N. by E. $\frac{1}{2}$ E. course. Continue on this course about $5\frac{1}{2}$ miles, until Despair Island, the small island off the northeastern end of Hope Island, bears ESE., when change the course to NE. $\frac{1}{2}$ N. This course made good for nearly $1\frac{1}{2}$ miles will lead up to black buoy No. 7; leave this buoy on the port hand and red buoy No. 2 on the starboard hand and steer N. for Warwick Lighthouse.

When a little less than $\frac{1}{2}$ mile to the southward of Warwick Lighthouse, and just after passing red buoy No. 4, haul to the eastward and steer **NE.** by **E.** $\frac{1}{2}$ **E.**, passing about midway between the lighthouse and the northwestern point of Patience Island. The last course made good for $1\frac{1}{2}$ miles will lead to a position a little to the northward of the buoy (red and black horizontal stripes) lying $\frac{1}{2}$ mile to the northward of *North Point* (the northern point of Prudence Island). Now make good a **N NE.** $\frac{1}{2}$ **E.** course until Conanicut Lighthouse bears **N NW.**, when haul up for the lighthouse and follow the sailing directions for Providence River.

Remarks.—The western shore of Dutch Island should in no case be approached closer than 250 yards. Dutch Island Lighthouse should be brought on the bearing astern when the northern end of the island is less than $\frac{1}{2}$ mile distant, to avoid Plum Beach Shoal.

On the **N.** by **E.** $\frac{1}{2}$ **E.** course, in clear weather, a very prominent high circular tower at Rocky Point will be directly ahead, and Warwick Lighthouse will be made a very little to the westward of the tower. The course leads at least $\frac{1}{2}$ mile from the shore of Conanicut Island and about 400 yards to the eastward of Plum Beach Shoal buoy (black, No. 1). *Conanicut Island Lighthouse* (on the northern extremity of Conanicut Island) will be left about $\frac{1}{2}$ mile on the starboard hand. *Hope Island*, $1\frac{1}{2}$ miles to the northward of Conanicut Island, will be left $\frac{1}{2}$ mile on the starboard hand. *Despair Island* is a small bare island lying a few hundred yards to the northeastward of the northern point of Hope Island, and will not be seen until nearly abreast the northern point of the latter island.

On the **NE.** $\frac{1}{2}$ **N.** course the southern extremity of Patience Island will be ahead and black buoy No. 7 and red buoy No. 2 should be made right ahead. These buoys mark the entrance to the 3-fathom channel leading between shoals up to Warwick Lighthouse.

On the **N.** course for Warwick Lighthouse, red buoy No. 4, off the edge of the shoals to the westward of Patience Island, will be made on the starboard bow and should be left about 300 yards on the starboard hand.

On the **NE.** by **E.** $\frac{1}{2}$ **E.** course, the southern extremity of Rumstick Neck will be directly ahead and the buoy off North Point will be a little on the starboard bow.

When the course is changed to **N NE.** $\frac{1}{2}$ **E.** the prominent tower at Rocky Point will bear **NW.**

Dangers.—Plum Beach Shoal has 14 feet of water near its end and makes out about $\frac{1}{2}$ mile from the western shore about 1 mile above Dutch Island. The eastern edge of the shoal is marked by a buoy (black, No. 1).

Great Ledge stretches along the west shore of Conanicut Island for a distance of 2 miles, its southern end being about $\frac{1}{2}$ mile to the northward of Dutch Island. The distance to which this ledge extends from the shore varies from 175 to 550 yards; it comprises a number of bare and sunken rocks and rises abruptly from deep water of the channel.

James Ledge and *Brig Ledge* are the easternmost of a number of dangerous ledges and rocks which lie in the northern side of the bight at the entrance to Wickford Harbor and to the southwestward of Quonset Point. *James Ledge* has 2 feet of water over it and is marked by a buoy (black, No. 3). *Brig Ledge* has 12 feet over it and is marked by a buoy (red and black horizontal stripes). These buoys bear about **S SW.** from Quonset Point.

Quonset Point Shoal extends about 450 yards to the southeastward from Quonset Point, the point on the west shore $1\frac{1}{2}$ miles **NW.** $\frac{1}{2}$ **W.** from Conanicut Island Lighthouse. The shoal is marked at its eastern end by a buoy (black, No. 5).

Several rocks and shoals lie close to the shores of Hope Island, but they may all be avoided by giving the shores of that island a berth of $\frac{1}{2}$ mile.

Shoals fill the bight between Quonset Point and Calf Pasture Point, the point about $2\frac{1}{2}$ miles to the northward. To avoid these a vessel should haul to the eastward when the water shoals to 18 feet. Abreast Calf Pasture Point and for some distance to the northward of it shoal water extends $\frac{1}{2}$ mile to the eastward from the shore.

Shoals make to the eastward from the entrance to Greenwich Bay and extend nearly to Patience Island. For a distance of 1 mile to the eastward of *Pojack Point*, the southern point at the entrance to Potowomut River, the shoal has depths of 2 to 12 feet of water over it and has a number of rocks and ledges, which are marked by a beacon (black, square wooden cage on top). The beacon lies $\frac{1}{2}$ mile **SW.** by **W.** $\frac{1}{2}$ **W.** from Warwick Lighthouse and is surrounded by rocks having from 1 to 6 feet of water over them; *Hunts Ledge* with 12 feet of water over it lies $\frac{1}{2}$ mile **SE.** from it and is the easternmost of the rocks surrounding the beacon. From this beacon a shoal with 14 to 17 feet over it extends $\frac{1}{2}$ mile to the northward and eastward and $1\frac{1}{2}$ miles in **S SE.** $\frac{1}{2}$ **E.** direction; its southern point is marked by a buoy (black, No. 7). Between this shoal and the shoal making to the westward and southward from Patience Island there is a channel with a least width of 300 yards and a depth of from 3 to 12 fathoms, leading up to Warwick Neck.

The shoals making off to the eastward from Warwick Neck, between Sand Point (the point about $\frac{1}{2}$ mile to the northward of Warwick Lighthouse) and Rocky Point have 14 feet of water over them about $\frac{1}{2}$ mile from the shore.

Ohio Ledge, *Conimicut Middle Ground*, and the shoal making to the northward from Prudence Island are described on pages 108 and 109.

NEWPORT HARBOR.*

This harbor is on the eastern side of the Eastern Passage of Narragansett Bay, about $3\frac{1}{2}$ miles above the entrance. It is divided by Goat Island into an inner and outer harbor, and is an important harbor of refuge for coasters and yachts in southerly gales. The approach is well marked by lighthouses and fog signals, making it one of the easiest harbors on the coast for large vessels to enter at any time.

* Shown on chart 3537, scale $\frac{1}{20,000}$, price \$0.40. See also footnote on page 104.

The **Outer Harbor** is on the western side of Goat Island, to the northward of Fort Adams and to the southeastward of Rose Island. Its entrance from the southward is unobstructed, but from the northward it is reached by passing between the rocks and ledges which lie between Coasters Harbor Island and Rose Island. The depth ranges from $6\frac{1}{2}$ to 9 fathoms, and the holding ground is good. The anchorage is anywhere to the westward of Goat Island and the breakwater, giving them a berth of over 250 yards, and taking care not to get too near the rocks and ledges to the eastward of Rose Island.

The **Inner Harbor** is on the eastern side of Goat Island, and extends along the western front of the city of **Newport**. It has two entrances, the northern leading to the eastward of Newport Harbor (Goat Island) Lighthouse and the southern leading around the southern end of Goat Island, between it and Lime Rock Lighthouse. A channel, with a depth of 15 feet at low water, leads through the harbor from the southern to the northern entrance, but the anchorage, which is to the eastward of this channel, has a depth of 13 feet. The depth of water at the principal wharves is 13 feet and at the Old Colony Railroad wharf 16 feet.

Brenton Cove is the light in the southern part of Newport Harbor between **Lime Rock Lighthouse** on the east, and Fort Adams on the west. It has anchorage in 15 to 17 feet water, but the holding ground is not good throughout and it is seldom used.

The city of **Newport**, on the eastern shore of the inner harbor, is one of the principal summer resorts on the Atlantic coast. It has considerable trade in coal, lumber, and building material, carried in coasting vessels; few foreign vessels enter the port.

Prominent objects.—Many prominent objects will be seen, whether the harbor be approached from the southward or northward, among which are the following: Fort Adams, the buildings of the Training Station and Naval War College on Coasters Harbor Island, the buildings of the Torpedo Station on Goat Island, and the large hotels and a tall red water tank at Jamestown on the eastern shore of Conanicut Island, opposite Rose Island. Although these objects are plainly visible in clear weather, the lighthouses should be the guides at all times.

Pilots.—Strangers sometimes take a pilot; vessels can obtain one by making signal off Block Island, or lying off and on outside Brenton Reef Light-vessel with signal set until boarded. Pilotage is compulsory for certain vessels (see pilot laws for the State of Rhode Island in Appendix I).

Towboats are often used by vessels in the inner harbor when desiring to go alongside the wharves. They can be had by making signal.

Quarantine regulations for the port and quarantine anchorage will be found in Appendix I.

Marine Hospital.—Seamen entitled to treatment will be furnished with medical attendance by an acting assistant surgeon of the Marine Hospital Service. Those requiring long continued hospital treatment are sent to the Marine Hospital at Stapleton, Staten Island, New York.

Wind signals of the U. S. Weather Bureau are displayed from the top of the custom-house and are visible from all parts of the harbor.

A **time ball** is dropped from a mast on the top of a machine shop of the U. S. Torpedo Station on Goat Island at exactly noon of the 75th meridian—that is, 5 hours, 0 minutes, 0 seconds Greenwich mean time. The ball is mast-headed 5 minutes before noon, and in case it fails to drop at the proper moment, is lowered by hand 5 minutes after noon. The ball is $3\frac{1}{2}$ feet in diameter and has a drop of 14 feet. This time signal is maintained and operated by the Navy Department and the ball is dropped by electric signal from the U. S. Naval Observatory, Washington, D. C.

Supplies.—Coal and water can be had alongside the wharves or out in the stream. Provisions and ship chandler's stores can be obtained in the city.

For tidal data see the table on page 22.

For variation of the compass see page 22.

Ice sometimes obstructs navigation in the inner harbor (see "Ice," page 106).

SAILING DIRECTIONS, NEWPORT HARBOR.

The following directions are good for either day or night.

1. Approaching and Entering from the Southwestward.—Follow the directions in sections 1, 1 or 1 A, on pages 106 and 107, for entering Narragansett Bay by the Eastern Passage and then proceed as directed in paragraphs I, II, or III, following.

I. To an anchorage in the Outer Harbor.—Steer for Newport Harbor Lighthouse, keeping it bearing NE. by E. until past Fort Adams, when you may anchor anywhere in 8 to 9 fathoms to the westward of Goat Island and the breakwater, giving the shore and breakwater a berth of not less 250 yards. Or, haul a little more to the northward, leave Newport Harbor Lighthouse 300 yards on the starboard hand and anchor to the eastward of the line between this lighthouse and Gull Rocks Lighthouse, with Newport Harbor Lighthouse bearing to the southward of SSW. and Gull Rocks

Lighthouse to the northward of NW. by W. Within these limits the depth varies from 4 to 9 fathoms and the bottom is generally sticky.

Remarks.—Fort Adams will be left about $\frac{1}{2}$ mile on the starboard hand and there are no dangers if the shore be given a berth as directed.

II. To enter the Inner Harbor by passing S. of Goat Island.—This passage should not be taken by vessels of over 12 feet draught, as it leads into the harbor where there is 13 to 15 feet of water. Steer NE. by E. for Newport Harbor Lighthouse until Lime Rock Lighthouse is opened to the southeastward of the dock to the northward of Fort Adams, then round the northern extremity of the dock, giving it a berth of at least 150 yards. Steer SE. by E. with Lime Rock Lighthouse on the starboard bow and Goat Island Shoal Dolphin on the port bow; pass nearly midway between the two, favoring the latter a little, and when fair between them change the course to NE. by E. for the end of the long wharf (Commercial wharf). Anchor almost anywhere in the harbor, in 13 to 17 feet of water, soft bottom, but not close enough to the wharves to interfere with the steamer and ferry traffic, or to lie in the track of the Sound steamers.

Remarks.—There is a fog bell on the northern end of the dock north of Fort Adams. The southern extremity of Goat Island should be given a berth of at least 300 yards.

At night when between Goat Island Dolphin and Lime Rock Lighthouse a vessel may steer for the electric lights on Commercial wharf or those at the Old Colony wharf, farther to the northward.

Anchorage in 15 to 17 feet, hard bottom, will be found in Brenton Cove, which may be entered without danger by giving its shores a berth of about 225 yards.

Dangers.—There are no dangers if the directions be even approximately followed.

A shoal makes out nearly 300 yards to the southward and southeastward from the southern extremity of Goat Island. Goat Island Dolphin marks the southeastern extremity of this shoal, and vessels should not attempt to pass between the island and the Dolphin.

III. To enter the Inner Harbor by passing N. of Goat Island.—Keep Newport Harbor Lighthouse bearing NE. by E. until within $\frac{1}{2}$ mile of it, when steer more to the northward and round the lighthouse at a distance of about 300 yards, and when it bears SW. steer S. $\frac{1}{2}$ W. into the harbor.

Remarks.—After rounding the lighthouse and when on the S. $\frac{1}{2}$ W. course the Old Colony wharf will be on the port bow and Lime Rock Lighthouse will be a little on the starboard bow. The shore line of Goat Island to the northward and southward of the wharf on its eastern side should be given a berth of at least 200 yards. Good anchorage in 13 feet of water is found between Commercial wharf and the Old Colony wharf.

1 A. Approaching and Entering from the Northward.—From abreast Prudence Island Lighthouse make good a SSW. $\frac{3}{4}$ W. course, passing about $\frac{3}{4}$ mile to the eastward of Gould Island. Or, from a point about 1 mile to the eastward of Conanicut Island Lighthouse make good a S. by W. course, passing about 300 yards to the westward of Gould Island. The above courses lead well clear of all dangers. Rose Island Lighthouse will be made a little on the port bow.

To enter:

I. Passing to the Westward of Rose Island.—Pass about $\frac{1}{2}$ mile to the westward of Rose Island Lighthouse, and when it bears NE. by E. $\frac{1}{2}$ E. steer about E. $\frac{1}{2}$ S. for Newport Harbor Lighthouse and enter as directed in section 1, paragraph III foregoing; or, steer more to the southward and anchor to the westward of Goat Island, giving the shore a berth of at least 250 yards.

II. Passing to the Eastward of Gull Rocks Lighthouse.—This is the most direct entrance to Newport Harbor when coming from the northward. When to the southward of Gould Island bring Newport Harbor Lighthouse to bear S. $\frac{1}{2}$ E. and stand in, keeping the bearing. Leave the black buoy (No. 3) to the northward of Gull Rocks about 100 yards on the starboard hand and pass not less than 100 yards (nor more than 300 yards, if drawing over 17 feet) to the eastward of Gull Rocks Lighthouse. Anchor anywhere on the line for Newport Harbor Lighthouse, or enter the Inner Harbor as directed in section 1, paragraph III, foregoing.

Remarks.—When to the southward of Gould Island, three lighthouses will be visible in clear weather, Newport Harbor Lighthouse, Gull Rocks Lighthouse, and Rose Island Lighthouse; the first two showing nearly in the same direction, the last showing to the westward of the others, and beyond and to the eastward of all will be seen the city of Newport.

The passage to the westward of Rose Island is much the safer in thick weather. On the S. $\frac{1}{2}$ E. course for Newport Harbor Lighthouse, Gould Island Lighthouse, if it can be seen, will be directly astern. Many prominent objects will be seen as the city is approached (see page 111).

Dangers.—The *Sisters* and *Bishop Rock* are described on page 108.

Rose Island is surrounded by shoals which rise abruptly from deep water. The shoal water extends less than 200 yards from the shore of the island on its western side; but on its northern and northeastern sides the shoal extends off about 450 yards and has from 4 to 12 feet over it, with only about 5 feet on its eastern edge. The southern point of the shoal is marked by a black spindle with a keg-shaped cage on top. On the southwestern point of the island is *Rose Island Lighthouse* (see table, page 16).

Gull Rocks lie about midway between *Rose Island* and *Coasters Harbor Island*, and are small in extent. *Gull Rocks Lighthouse* is on the middle of the rocks, and may be approached to within less than 100 yards on its eastern and western sides, but the shoals and rocks extend over 100 yards to the northward of it and 300 yards to the southward. These rocks are surrounded by a depth of $4\frac{1}{2}$ to 5 fathoms.

There is a deep channel between *Rose Island* and *Gull Rocks* and also between the latter and *Coasters Harbor Island*; the latter channel is the safer for strangers.

Tracey Ledge, a small ledge with only $9\frac{1}{2}$ feet of water over it and surrounded by a depth of over 6 fathoms, lies 560 yards S. by W. $\frac{1}{2}$ W. from *Gull Rocks Lighthouse*, and is marked by a buoy (black, No. 1), which may be left on either side in passing through the channel between *Rose Island* and *Gull Rocks*, but vessels should pass well to the eastward or southeastward when entering or leaving the harbor by any other channel.

Mitchell Rock, with a depth of 14 feet over it and 4 fathoms around it, lies 600 yards SE. by E. $\frac{1}{2}$ E. from *Rose Island Lighthouse*, and 900 yards WNW. $\frac{1}{2}$ W. from *Newport Harbor Lighthouse*, and is not marked.

A shoal, with 5 to 18 feet over it, extends nearly 400 yards to the southward from the southern end of *Coasters Harbor Island* and extends to the eastward to the shore of *Rhode Island*.

St. Patricks Rock, with 11 feet over it, lies 200 yards from the eastern shore and 800 yards NE. by N. from *Newport Harbor Lighthouse*, and is marked by a buoy (red, No. 4).

An 18-foot spot lies 275 yards from the shore and 450 yards NE. by N. from *Newport Harbor Lighthouse*, and is not marked, but is not a danger for the draught of vessels entering the Inner Harbor.

MOUNT HOPE BAY AND TAUNTON RIVER.*

Mount Hope Bay lies in the northeastern part of Narragansett Bay and is the approach by water to the city of Fall River and to Taunton River, which empties into its northeastern end. It is about 6 miles long in a NE. by N. and SW. by S. direction and $2\frac{1}{2}$ miles wide at its widest part. The northwestern and northern parts of the bay have depths of 13 to 17 feet, except around a few dangers, which are described under the sailing directions; the deep water of the bay is in its southern end and along the eastern shore. Several shallow rivers empty into the northern part of Mount Hope Bay, but they are of no commercial importance. There are two approaches by water to this bay—one through Sakonnet River and the other through the Eastern Passage of Narragansett Bay; the former is little used (see heading Sakonnet River); the entrance from the latter is marked by two lighthouses and a light-vessel, and has a least depth of 7 fathoms in the channel until well into the bay.

Taunton River has a narrow and crooked channel, which is being improved by the U. S. Engineers to a depth of 11 feet at mean high water, and a width varying from 40 to 100 feet, as far as Taunton. Two drawbridges cross the river between Fall River and the head of navigation. Vessels bound into the river usually take a towboat at Fall River.

The city of *Fall River*, on the eastern shore at the entrance to Taunton River, has a considerable coasting trade; large cargoes of coal are brought for its factories. At high water a draught of 20 feet can be taken up to the city; the depth at the wharves is 10 to 18 feet at low water.

Somerset, about $5\frac{1}{2}$ miles, and *Dighton*, about $7\frac{1}{2}$ miles above Fall River, on the west bank of Taunton River, are two villages to which vessels occasionally bring cargoes. A draught of 16 feet can be taken to Somerset and 14 feet to Dighton.

Taunton is an important manufacturing city at the head of navigation, $12\frac{1}{2}$ miles above Fall River. It has a large coasting trade, principally lumber and coal, carried in schooners and barges. Vessels of 11 feet draught can come to the city, but, as the channel is very narrow, sailing vessels are obliged to use a towboat.

Anchorage.—There is good anchorage in $3\frac{1}{2}$ to 5 fathoms water abreast the city of Fall River. Vessels can anchor anywhere in the bay where the depth and bottom are suitable.

Pilots for vessels bound to Fall River can be obtained at the entrance to Narragansett Bay; the rates of pilotage are the same as for ports in Rhode Island (see Appendix I).

Towboats are seldom used except by the largest vessels and those bound into Taunton River; they can be had from Fall River or may be taken at Newport.

Supplies.—Ships' supplies and coal for steamers can be had at Fall River.

Repairs.—There is one marine railway capable of hauling out vessels of less than 800 tons.

Wind signals of the U. S. Weather Bureau are displayed at Fall River.

Harbor regulations for Fall River are contained in the extracts from the Laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix I.

* Shown on chart 353, scale $\frac{1}{40,000}$, price \$0.75.

MOUNT HOPE BAY—SAILING DIRECTIONS.

Quarantine.—The following is an extract from the Regulations of the Board of Health:

"All vessels arriving at this port from any port where cholera, yellow fever or any other contagious disease prevailed at the time of said vessel's sailing therefrom, or having on its arrival, or having had during its voyage either of said diseases on board, shall anchor southerly from the lighthouse on Borden Flats, and not less than 2,000 feet westerly from the easterly shore of Mount Hope Bay, at quarantine, and there be examined by the city physician. Such vessels shall only be allowed to come up to the city after an examination and upon the certificate of said physician that in his opinion the health of the city would not be endangered thereby."

Tides.—The mean rise and fall of tides at Dighton is about 5 feet, and at Taunton about 3½ feet. For tidal data at Fall River see the table on page 22.

Ice generally closes Taunton River from December to March. Mount Hope Bay is occasionally closed to navigation.

SAILING DIRECTIONS, MOUNT HOPE BAY.

The following directions carry a least depth of 16 feet at low water to the city of Fall River.

Directions are given on pages 103 and 104 for approaching Mount Hope Bay through Sakonnet River, and passing up the bay to Fall River.

Entering and passing through Mount Hope Bay to Fall River.—Having followed the directions on pages 106 and 107 for the Eastern Passage of Narragansett Bay, when abreast Prudence Island Lighthouse bring Hog Island Shoal Light-vessel in range with Bristol Ferry Lighthouse, bearing about NE. ½ E. and steer for the light-vessel, keeping the range. When up to the light-vessel pass a little to the southward of it, then bring it to bear SW. ½ W. and make good a NE. ½ E. course, passing about midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse. Borden Flats Lighthouse should be made directly ahead and kept on the bearing, NE. ½ E., until within 1 mile of it, when the course should be changed about one point more to the eastward, so as to pass about 400 yards to the eastward of the lighthouse. Anchor to the eastward or northeastward of the lighthouse in 15 feet to 5½ fathoms of water.

If bound up Taunton River a stranger should take a pilot or towboat.

Remarks.—The lighthouses and light-vessel furnish excellent guides; all shoals and dangers which have less than 16 feet of water over them can be avoided by keeping Prudence Island Lighthouse bearing between Bristol Ferry and Muscle Shoal lighthouses, and giving the eastern shore of the bay a berth of about 200 yards. Bristol Ferry Lighthouse is on the northern side of the entrance to Mount Hope Bay and Muscle Shoal Lighthouse on the southern side.

Dangers.—The shore to the southward of Hog Island Shoal Light-vessel should be given a berth of at least 500 yards.

Between Muscle Shoal Lighthouse and Common Fence Point (the western point at the northern entrance to Sakonnet River) shoals make out from the shore to a distance of 300 to 600 yards; to the northward of Common Fence Point the extremity of the shoal is marked by a buoy (red, No. 2).

There are shoals and bare rocks in the bight between Bristol Ferry Lighthouse and Mount Hope Point (the point 1½ miles to the northeastward of the lighthouse), but near the southern edge of the shoals are two buoys (black, Nos. 1 and 3).

Spar Island, the small bare island near the center of Mount Hope Bay, is surrounded for a distance of nearly 400 yards by shoals, with a depth of 3 to 10 feet over them.

Borden Flats, with 5 to 10 feet of water on them, extend from Borden Flats Lighthouse to Brayton Point, nearly 1 mile to the westward of the lighthouse.

In the bight to the northward of the Old Colony wharves at Fall River there is a depth of 13 to 17 feet.

BRISTOL HARBOR*

is a cove lying between Bristol Neck on the E. and Popasquash Neck on the W. and to the northward of Hog Island, which lies in the middle of the entrance, with a channel on either side of it. The cove is about 2 miles long N. and S. and 1½ miles wide at its southern end, narrowing to ½ mile at its northern end. The harbor proper (northern part of the cove) is about 1 mile long and nearly ½ mile wide, has a depth of 15 to 17 feet, and excellent anchorage in soft bottom abreast the town. The northern part of the harbor above the railroad wharf is shallow, having a depth of 5 to 12 feet.

Bristol, a town on the eastern side of the harbor, has but little trade and is of no commercial importance. Near the southern end of the water front of the town are the boat building works of the Herreshoff Company, famous for the great speed of some of its boats.

* Shown on chart 354, scale $\frac{1}{20,000}$, price \$0.20; 113, scale $\frac{1}{20,000}$, price \$0.50.

Channels.—There are two channels leading up to the entrance of the harbor proper. The **Eastern Channel**, to the eastward of Hog Island, between it and Bristol Neck, has a width varying from 200 to 600 yards (the average width being only about 300 yards) and a depth of 3 to 4½ fathoms. The **Western Channel**, to the westward of Hog Island, between it and Popasquash Neck, has a width of 300 to 600 yards (the average width being about 500 yards) and a depth of 3 to 4½ fathoms. These two channels converge and come together ½ mile to the northward of the northern end of Hog Island, at the extremity of the shoal making off from it, and at the lower end of the harbor proper. The Western Channel is the better marked and one mostly used.

Pilots are not necessary for vessels desiring to enter the harbor.

Anchorage.—Good anchorage is found in 15 to 17 feet abreast the town, giving the eastern and western shores a berth of 200 yards.

Wharves.—At low water 8 to 11 feet can be taken to some of the wharves.

Communication.—Bristol is connected by rail with Warren, which is in turn connected by rail with Providence and Fall River. A regular steamer line between Fall River and Providence stops at Bristol.

Supplies.—Provisions and coal, in limited quantities, can be obtained at Bristol.

Tides.—The mean rise and fall of tides is 4.4 feet; corrected establishment 7^h 53^m.

The velocity of the **tidal currents** is not great enough to interfere materially with the navigation of the channels and harbor.

Ice.—See remarks on page 105.

SAILING DIRECTIONS, BRISTOL HARBOR.

The following directions are safe for vessels of 15 feet, or less, draught to an anchorage abreast the town.

1. Approaching and Entering by the Eastern Channel.—Follow the directions for entering Mount Hope Bay and when about midway between Hog Island Shoal Light-vessel and Muscle Shoal Lighthouse steer **N. ½ W.** Pass about ¼ mile to the westward of Pearce Rock buoy (red, No. 2) and 200 yards to the eastward of Hog Island Rock buoy (black, No. 3) and continue the course about 1 mile farther until ½ mile to the eastward of Middle Ground buoy (red and black horizontal stripes), then haul a little more to the westward and stand fair into the harbor.

Anchor abreast the town, giving the shores a berth of at least 200 yards.

Remarks and Dangers.—Shoals make out over ½ mile to the southward of Hog Island, and vessels must pass to the southward of Hog Island Shoal Light-vessel.

Pearce Rock lies nearly ¼ mile **W.** from Bristol Ferry Lighthouse and is marked by a buoy (red, No. 2).

The southern and western shores of Bristol Neck should be given a berth of at least 250 yards to avoid the shoals making off that distance.

The eastern shore of Hog Island should be given a berth of at least 350 yards to avoid the shoals on its eastern side. Hog Island Rock buoy (black, No. 3) marks the eastern edge of the shoal about ½ mile to the northward of the southeastern end of the island.

Making to the northward from Hog island is an extensive shoal ground with depths of 3 to 12 feet, and a ruling depth of about 6 feet. For about ¼ mile to the northward of the island this shoal ground has a width of ½ mile, thence it narrows to a point at the junction of the channels 1 mile to the northward of the island. Near the northern end of the shoal there is a depth of only 5 feet, where it is marked by Middle Ground buoy (red and black horizontal stripes). Near the western edge of the shoal, about ½ mile to the northward of the northwestern end of the island is **Castle Island**, a small bare rock marked by Castle Island beacon (stone tower, surmounted by a red ball).

1 A. Approaching and Entering by the Western Channel.—**I. Coming from the Southward.**—From a position about ¼ mile to the eastward of Prudence Island Lighthouse make good a **N. by E.** course for 2¼ miles, leaving the buoy (red, No. 20) at least 200 yards on the starboard hand. Popasquash Point Shoal buoy (black, No. 1) will be made nearly ahead; when within ¼ mile of this buoy haul a little more to the eastward so as to leave it about 300 yards on the port hand.

When **Popasquash Point** (the southern extremity of Popasquash Neck) bears **W.** the course up the channel is **NE.**, with a tall white church spire back of Bristol in range with a tall red chimney near the water front. Castle Hill beacon and Middle Ground buoy should be left at least 200 yards on the starboard hand, and Usher Rocks buoy (black, No. 3) at least 100 yards on the port hand. When to the northward of Castle Island beacon the course may be changed to **N NE. ½ E.** for the railroad wharf (the northernmost of the town wharves).

Anchor abreast the wharves in 16 to 17 feet water.

II. Coming from the Northward.—Give the eastern shores of Prudence Island a berth of at least 400 yards and the western shore of Popasquash Neck a berth of at least 200 yards. Round Popasquash

WARREN RIVER—GENERAL DIRECTIONS.

Point, leaving the buoy on the port hand, and when the point bears **W.** steer **NE.** and follow the directions in paragraph I, foregoing.

Remarks.—In standing to the northward on the **N. by E.** course, Popasquash Point can be kept directly ahead. When Castle Island beacon bears **NE.** by **N.** the course may be changed to **NNE. $\frac{1}{2}$ E.** so as to pass about 300 yards to the westward of it, and thence directly up to the upper wharves of the town.

The church spire referred to in the directions is very prominent and can be seen for a long distance in approaching the harbor.

Dangers.—The shoals surrounding Hog Island are described under section 1, foregoing. The southwestern extremity of the shoal making off to the southwestward from the island is marked by a buoy (red, No. 20).

Popasquash Point Shoal makes off 400 yards in a **S SE.** direction from Popasquash Point, has 3 to 17 feet of water over it, and is marked at its southern edge by a buoy (black, No. 1).

Usher Cove is the small bight in the eastern shore of Popasquash Neck, about $\frac{1}{2}$ mile above Popasquash Point. The depth in the cove is only about 2 feet and the shoal water extends to the southward and eastward from its entrance for a distance of $\frac{1}{4}$ mile.

Usher Rocks, bare at low water, lie on the western side of the channel 800 yards **N NW. $\frac{1}{2}$ W.** from Castle Island beacon. To the eastward of the rocks on the edge of the channel is Usher Rocks buoy (black, No. 3).

WARREN RIVER *

is a small river emptying into the head of Narragansett Bay, about 2 miles to the southeastward of the mouth of Providence River.

Warren, the town on the east bank of Warren River, about $1\frac{1}{2}$ miles above its mouth, is of but little commercial importance.

The channel leading up to the town is narrow and crooked and although well buoyed, strangers should not attempt to ascend the river without a pilot. A draught of about 14 feet can be taken up to Warren at high water.

Tides.—The mean rise and fall of tides is 4.6 feet; corrected establishment $8^h 4^m$.

The tidal currents in some parts of the river run with considerable velocity, especially along the town front.

GENERAL DIRECTIONS TO AN ANCHORAGE IN THE MOUTH OF WARREN RIVER.

In approaching from the southward be guided by the directions in section 3, page 108, for approaching Providence River by the Eastern Passage. On a **N. $\frac{1}{4}$ E.** course give the western shore of Popasquash Neck a berth of 300 yards, and when abreast North Point (the point where the shore line of the neck turns abruptly to the eastward) steer **NE.** by **N.** for $1\frac{1}{2}$ miles. Leave Rumstick Shoal buoy (black, No. 1) 300 yards on the port hand, and when Rumstick Rock comes in range with Conimicut Lighthouse bearing about **NW.** by **W.** anchor in 15 to 16 feet of water, soft bottom.

If coming from the northward, bring Conimicut Lighthouse to bear **NW.** by **N.** and steer **SE.** by **S.** until Rumstick Rock bears **NE.** by **E.**, when change the course to **E.** by **S.**, pass at least 200 yards to the southward of Rumstick Shoal buoy (black, No. 1), then haul up to **NE.** by **N.** and continue on that course until Rumstick Rock comes in range with Conimicut Lighthouse, bearing about **NW.** by **W.**

Remarks.—From the anchorage the river will be fairly opened and the houses of the town of Warren can be seen.

The next buoy (black, No. 3) marking the channel lies nearly $\frac{1}{4}$ mile **N. $\frac{1}{4}$ E.** from the anchorage, but strangers should not attempt to go above it without a pilot.

Rumstick Neck is the neck of land on the western side of the river entrance.

Dangers.—The dangers in approaching the river are described under section 3, page 108.

A sunken rock and rock awash at low water lie about 200 yards to the northward of North Point.

Deyer Rock, a rock awash at low water, lies about 125 yards from the eastern shore, a little over $\frac{1}{2}$ mile above North Point.

The Brothers are two sunken rocks, with 7 feet of water over them, lying a little over 300 yards from the shore and about 350 yards to the northward of Deyer Rock.

The above described dangers may be easily avoided by giving the eastern shore a berth of 300 yards.

Rumstick Shoal extends nearly $\frac{1}{2}$ mile to the southward from Rumstick Neck, is about $\frac{1}{2}$ mile wide, and has a depth of 3 to 12 feet, the ruling depth being about 7 feet. Near its southeastern extremity it is marked by black buoy No. 1, and on its eastern edge, nearly $\frac{1}{4}$ mile **SE. $\frac{1}{2}$ E.** from the southern extremity of Rumstick Neck, is black buoy No. 3.

Rumstick Rock, showing well above water at all stages of the tide, is on Rumstick Shoal and lies **W SW. $\frac{1}{4}$ W.** from the southern extremity of Rumstick Neck.

Rumstick Ledge, a bare ledge nearly 100 yards long in a NW. and SE. direction and about 15 yards wide, lies about 150 yards to the northwestward of Rumstick Rock and near the western edge of Rumstick Shoal. The ledge is surrounded by a depth of 2 to 5 feet, but less than 50 yards to the westward of it the water deepens to 17 feet.

PROVIDENCE RIVER *

empties into the head of Narragansett Bay and is the approach by water to the city of Providence and town of Pawtuxet. The entrance between Nayat Point on the E. and Conimicut Point on the W. is about $\frac{1}{4}$ mile wide, but is obstructed by shoals on both sides, which leave an available channel about $\frac{1}{4}$ mile wide. On Nayat Point there is an old lighthouse tower now only serving as a day mark, and on the shoal making out from Conimicut Point is Conimicut Lighthouse (see table, page 16).

The city of Providence, about 7 miles above the entrance to the river and at its junction with Seekonk River, is an important commercial port. East Providence, a suburb of the city of Providence, is on the east bank of the river and is connected with the city proper by three drawbridges crossing the Seekonk River.

Pawtucket is a city at the head of navigation on the Seekonk River (also called Pawtucket River) about $4\frac{1}{2}$ miles from its mouth. For about 1 mile above its mouth the Seekonk River has a deep channel, but higher up it is very shallow. Under the supervision of the U. S. Army Engineers a channel 100 feet wide and 12 feet deep at mean low water has been completed as far as Bass Rock ($1\frac{1}{2}$ miles from the head of navigation) and to a width of 60 feet and a depth of 12 feet about $\frac{1}{2}$ mile farther, and work is in progress to finish this channel to a width of 100 feet and depth of 12 feet as far as the city wharves. The channel is buoyed, but it is too crooked and narrow for sailing vessels to navigate without the assistance of a towboat.

The town of Pawtuxet, on the west bank of Providence River about $3\frac{1}{2}$ miles above its mouth, has no commerce and can only be reached at high water by vessels of 7 feet draught.

Channel.—The channel of Providence River, leading between extensive shoals which make out from both shores, is well marked by lighthouses and other aids and can be readily followed in the daytime in clear weather. For a width of 300 feet the channel has a least depth of 25 feet to the city of Providence. From Conimicut Lighthouse to abreast Sabine Point Lighthouse, a distance of 3 miles, the $3\frac{1}{2}$ -fathom-channel has a width varying from 250 to 800 yards. From Sabine Point Lighthouse to the city, a distance of nearly 4 miles, the channel is dredged through flats having from 3 to 8 feet of water over them.

Anchorage.—The anchorage ground in the harbor of Providence is very limited; vessels usually anchor on the edge of the channel between Field Point and Fox Point, where the channel has been very much widened in order to furnish anchorage. There is anchorage to the eastward of Fox Point, where much of Green Jacket Shoal has been dredged away.

Wharves and drawbridges.—There are depths of 10 to 25 feet at the wharves below the bridges. The least width of the drawbridges crossing Seekonk River at Providence is 75 feet. Point Street drawbridge, crossing Providence River 600 yards above Fox Point (the point at the junction of the two rivers), has a clearance on each side of the central pier of 98 feet, and a draught of 15 feet can be taken through them to the wharves above.

Pilots.—Vessels desiring a pilot can get one at Newport, Dutch Island Harbor, or off the entrance, to Narragansett Bay. See "Pilots," page 105, and the pilotage laws for the state of Rhode Island, in Appendix I.

Towboats are generally used by the larger sailing vessels, and will sometimes be found at the entrance of the river waiting for vessels expected to arrive; they may also be obtained at Newport or Dutch Island Harbor.

Harbor and quarantine regulations for the port are given in Appendix I. The Marine Hospital Service has a representative at the custom-house, who will secure treatment and medicines for patients. Those requiring long continued hospital treatment are sent to the Marine Hospital at Chelsea, Mass.

Supplies.—Coal and water can be obtained alongside the wharves; provisions and ship chandler's stores in the city.

Repairs.—In East Providence there is one dry dock with a capacity for vessels of 2,000 tons and one marine railway capable of hauling out vessels of 500 tons. There are large machine shops in Providence with excellent facilities for repairs to the machinery of steamers.

For tides, see table, page 22.

Tidal currents are not strong, and generally follow the direction of the channel.

Ice.—In severe winters the river is closed to navigation, but in ordinary winters the towboats and steamers keep a channel open. See also "Ice," page 105.

SAILING DIRECTIONS, PROVIDENCE RIVER.

From the Entrances to the City of Providence.—Sailing directions for the Eastern Passage of Narragansett Bay are given on pages 106–108, and for the Western Passage on pages 109–110.

* Shown on charts, 1118, scale $\frac{1}{80,000}$, price \$0.50; 353, scale $\frac{1}{40,000}$, price \$0.75; and in part on 352, scale $\frac{1}{10,000}$, price \$0.20.

Having followed the directions in sections 3, page 108, or in section 2, page 109, until nearly up to Conimicut Lighthouse, haul a little to the eastward and leave that lighthouse about 200 yards on the port hand, and as it is passed haul more to the westward and steer about **NW**. Bullock Point Lighthouse will be on the starboard bow, and will soon come in range with Sabine Point Lighthouse bearing about **N. $\frac{1}{2}$ W.**; when this range is crossed haul up to **N. $\frac{1}{2}$ W.** and pass 300 yards to the westward of Bullock Point Lighthouse. From Bullock Point Lighthouse steer **N. $\frac{1}{2}$ W.**, leaving Gaspee Point buoy (black, No. 3) 175 yards, and Seal Rocks Flats buoy (black, No. 5) 200 yards on the port hand, and pass about 200 yards to the westward of Sabine Point Lighthouse.

A red buoy (No. 2) will be seen a little to the northward of Sabine Point Lighthouse; leave this buoy close-to on the starboard hand and make good a **NE. $\frac{1}{2}$ N.** course for $\frac{1}{2}$ mile. Great Bed Shoal buoy (black, No. 7) will be left close-to on the port hand, and Pomham Rocks buoy (red, No. 4) will be directly ahead; when nearly up to this latter buoy change the course to **N. $\frac{1}{2}$ W.**

Pass about 100 yards to the westward of Pomham Rocks Lighthouse, and continue the **N. $\frac{1}{2}$ W.** course, leaving black buoys Nos. 9 and 11 about 100 yards on the port hand, and when up to and about 75 yards to the westward of Lovett Rock buoy (red, No. 6) change the course to **NNW. $\frac{1}{2}$ W.**

Pass 50 yards to the westward of Fuller Rock Lighted beacon and steer **NW. $\frac{1}{2}$ N.** with Sassafras Point Lighted beacon ahead, or a very little on the port bow.

Passing 50 yards to the eastward of Sassafras Point Lighted beacon make good a **NNW.** course for a little over $\frac{1}{2}$ mile, then change the course to **N. $\frac{1}{2}$ W.** and stand up to the city with Fox Point a very little on the port bow.

Remarks.—Vessels should be guided mainly by the lighthouses and buoys; the distance from one to another is short and the channel narrow. The courses given above are correct, but care must be taken not to be set off them by the currents, especially between Sabine Point Lighthouse and Fuller Rocks Lighted beacon.

A short distance above Sassafras Point there is a long wharf; the outer end of this wharf kept in range with Sassafras Point Lighted beacon will guide clear of the shoals between this beacon and Fuller Rocks Lighted beacon.

When the course is changed from **NNW.** to **N. $\frac{1}{2}$ W.** you should be on a line between the end of the long wharf above Sassafras Point and the end of the Wilkesbarre Coal Company's wharf on the eastern shore. The **N. $\frac{1}{2}$ W.** course leads about 200 yards to the westward of the end of the last mentioned wharf.

The lighthouses and lighted beacons are described in the table on page 16.

Dangers.—Shoals bound the channel its entire length, rising very abruptly in many places, and no useful description can be given of them.

GREENWICH BAY*

is situated at the northwestern end of Narragansett Bay, its entrance being between Warwick Neck and Potowomut Neck. The bay is about $2\frac{1}{2}$ miles long E. and W., has an average width of about 1 mile and an average depth for the greater part of its area of about 10 feet. Old Warwick Cove and Brush Neck Cove are shallow coves in the northeastern part of Greenwich Bay, and Apponaug River, a shallow stream, empties into the northwestern part. Nearly 1 mile above the mouth of the river is the village of Apponaug.

Greenwich Cove, $1\frac{1}{2}$ miles long, 300 to 600 yards wide, and with a general depth of 7 to 10 feet, makes to the southward from the southwestern corner of Greenwich Bay. On the western shore of the cove is the town of East Greenwich.

The channel up to the town is very narrow, with a least depth of 10 feet, and strangers should not attempt to navigate it without a pilot.

Tides.—The mean rise and fall of tides is 4.5 feet; corrected establishmet 8^h 00^m.

SAILING DIRECTIONS, GREENWICH BAY.

To the Entrance of Greenwich Cove.—The following directions are good for vessels of 9 feet draught or less: Follow the directions in section 2, page 109, until within 500 yards of Warwick Lighthouse, then make good a **NW. $\frac{1}{2}$ W.** course for about $1\frac{1}{2}$ miles. Leave Sandy Point Shoal buoy (black, No. 1) close-to on the port hand and when $\frac{1}{2}$ mile past it change the course to **NW.** by **W. $\frac{1}{2}$ W.**

Sally Rock buoy (black, No. 3) will be made on the port bow, and a large hotel with flagstaff will be seen on Horse Neck just to the eastward of the entrance to Brush Neck Cove (the second cove in the northeastern part of Greenwich Bay); when the flagstaff bears **E NE. $\frac{1}{2}$ E.** bring it over the stern and make good a **WSW. $\frac{1}{2}$ W.** course, passing about 130 yards to the northward of Sally Rock buoy. On this course a number of houses on a bluff will be seen directly ahead, and Chippanogset Island Shoal buoy (red, No. 2) will be made right ahead. Pass close to the southward of this buoy and continue

*Shown on charts, 351, scale $\frac{1}{20,000}$, price \$0.20; 353, scale $\frac{1}{40,000}$, price \$0.75; and 113, scale $\frac{1}{80,000}$, price \$0.50.

the course about $\frac{1}{4}$ mile farther and anchor when to the northward of Long Point Shoal buoy (black, No. 5), the houses on the bluffs bearing W.

Remarks and dangers.—The dangers to the eastward of Potowomut Neck are described on page 110. If the NW. by W. $\frac{1}{2}$ W. course be made good for nearly 2 miles it will lead to good anchorage in 7 to 10 feet of water off the mouth of Apponaug River.

A number of **sunken rocks** lie to the southward and southwestward of Warwick Neck, but they may be easily avoided by giving the shore line a berth of at least 300 yards.

Sandy Point Shoal buoy (black, No. 1), lying nearly 1 mile WNW. from Warwick Lighthouse, marks the northeastern extremity of the extensive shoal, with 5 to 7 feet of water over it, which makes out to that distance from Sandy Point.

Sally Rock, with 5 feet of water over it, lies nearly $\frac{1}{4}$ mile to the northward of Potowomut Point (the north point of Potowomut Neck), and is marked by black buoy No. 3. Between this buoy and the shore are other rocks and shoals, and vessels should never pass to the southward of it.

Chippagogset Island is the small island in the extreme western part of the bay and to the northward of the entrance to Greenwich Cove. From this island shoals, with 1 to 4 feet of water over them, make off 500 yards to the northward and 300 yards to the eastward and southeastward; the southeastern extremity is marked by red buoy No. 2.

From **Long Point**, the northwestern point of Potowomut Neck, shoals make out to the northward and north-westward for a distance of about 300 yards.

WICKFORD HARBOR.*

in the west shore of Narragansett Bay to the westward of the northern end of Conanicut Island, comprises an outer and inner harbor. The outer harbor is a broad bight between Quonset Point on the N. and Wild Goose Point on the S.; between these points it is about 2 miles wide, but the northern part is full of rocks and shoals which extend about 1 mile in a southerly direction from Quonset Point; the southern part has good anchorage (soft, sticky bottom) in 14 to 17 feet of water, and there are no dangers if vessels keep to the eastward of a line between **Fox Island** (the island lying $\frac{1}{2}$ mile to the southeastward of Wild Goose Point) and Wickford Harbor Lighthouse.

The entrance to the inner harbor is a little more than $\frac{1}{4}$ mile wide between **Sauga Point** on the N. and **Poplar Point** on the S., but the shoals making out from these points leave only a narrow channel, which is marked by and lies just to the northward of **Wickford Harbor Lighthouse**, which is on Old Gay Rock, about 300 yards NE. by E. from the old lighthouse tower on Poplar Point.

The entrance channel between the points leads to the common junction of three coves, **Fishing Cove** to the northward, **Mill Cove** to the northwestward, and **Wickford Cove** to the southwestward. The first two of these coves are shallow and of no importance. Wickford Cove has a depth of about 10 feet, but the channel is very narrow, and strangers should not enter without a pilot, who may be had by making signal while to the eastward of the lighthouse.

The town of **Wickford**, on the west side of Wickford Cove, is of little commercial importance; cargoes of coal are brought to it in vessels drawing as much as 12 feet, and a steamer makes several trips daily to Newport, connecting at Wickford with the Shoreline Railroad. The depth at low water alongside the wharves is 7 to 10 feet.

Tides.—The mean rise and fall of tides is 4.2 feet; corrected establishment 7^h 52^m.

Ice.—In severe winters the inner harbor is closed by ice, but the outer harbor is usually open, although drift ice is occasionally encountered. See also "Ice," page 105.

SAILING DIRECTIONS, WICKFORD HARBOR.

The following directions are safe for vessels of 12 feet draught to an anchorage $\frac{1}{4}$ mile to the southeastward from Wickford Harbor Lighthouse; vessels should take a pilot to enter the inner harbor.

1. From the Northward or Northeastward.—Pass $\frac{1}{2}$ mile to the eastward of Quonset Point and steer SW. $\frac{1}{2}$ S., with Fox Island ahead; or, round Conanicut Island Lighthouse, giving it a berth of at least 300 yards and steer W. $\frac{1}{2}$ S.

Leave James Ledge buoy (black, No. 3), marking the southernmost of the ledges to the southward of Quonset Point, about 100 yards on the starboard hand.

When Wickford Harbor Lighthouse bears WNW. steer for it, being careful to keep it bearing between WNW. and NW. $\frac{1}{2}$ N. Anchor in 14 to 15 feet when within $\frac{1}{4}$ mile of the lighthouse, or anywhere in approaching it between the bearings given above.

* Shown on charts 357, scale $\frac{1}{20,000}$, price \$0.20; 353, scale $\frac{1}{40,000}$, price \$0.75; and 113, scale $\frac{1}{80,000}$, price \$0.50.

WICKFORD HARBOR—SAILING DIRECTIONS.

Remarks.—The courses given above lead clear of all dangers, and can be easily followed. All dangers off the southwestern shore of the harbor will be cleared by keeping to the eastward of a line joining Fox Island and Wickford Harbor Lighthouse.

Dangers.—A shoal with numerous ledges and rocks makes to the southward and southwestward, about 1 mile from Quonset Point; a number of these rocks and ledges are buoyed, and 7 feet may be taken across the shoal, but strangers should always pass to the southward of the southernmost, **James Ledge**, which has 2 feet of water over it, and is marked by a buoy (black, No. 3). **Brig Ledge**, marked by a buoy (red and black horizontal stripes), is the easternmost of these dangers, and lies a little more than $\frac{1}{2}$ mile SSW. from Quonset Point and nearly $\frac{1}{2}$ mile NNE. from James Ledge.

South White Rock, marked by a prominent stone-colored beacon, is the southwesternmost of the rocks to the southward of Quonset Point.

1 A. *From the Southward.*—Follow the directions in sections 1 and 2, pages 109 and 110, for entering and passing up Narragansett Bay by the Western Passage until past Dutch Island. Make good a N. by E. $\frac{1}{2}$ E. course, with Dutch Island Lighthouse over the stern, until Wickford Harbor Lighthouse bears NW. $\frac{1}{2}$ N., then head for the lighthouse on that bearing.

Keep Wickford Harbor Lighthouse bearing between NW. $\frac{1}{2}$ N. and WNW. as it is approached, and anchor anywhere in 13 to 17 feet of water.

See remarks and dangers under section 1, preceding.

DUTCH ISLAND HARBOR *

lies in the Western Passage of Narragansett Bay, and is a semicircular indentation (with a radius of about $\frac{1}{2}$ mile) making into the western side of Conanicut Island, about 3 miles above Beavertail. Dutch Island is on the western side of the harbor, which may be entered by passing either to the northward or the southward of the island. The harbor affords excellent anchorage in 2 to 8 fathoms, sticky bottom, is easy of access, and is frequently used as a harbor of refuge by coasters.

Dutch Island Lighthouse is on the extreme southern end of Dutch Island, and is the guide for vessels coming up the Western Passage and entering Dutch Island Harbor by the southern entrance.

SAILING DIRECTIONS, DUTCH ISLAND HARBOR.

1. *From the Southward.*—Follow the directions in section 1, page 109, until within less than $\frac{1}{4}$ mile of Dutch Island Lighthouse, then change the course to NE. $\frac{1}{2}$ E. and stand into the harbor. Pass to the northward of Beaverhead Point Shoal buoy (red, No. 2) and anchor according to draught and direction of the wind (see remarks below).

Remarks.—In seeking anchorage, if of over 18 feet draught, give the eastern shore of the harbor a berth of at least $\frac{1}{2}$ mile; if of less than 14 feet draught the eastern shore may be approached as close as 300 yards and closer in places. The eastern shore of Dutch Island should be given a berth of 150 yards.

After passing to the northward of Beaverhead Point Shoal buoy do not bring Beaverhead to bear to the westward of W. by S.

Dangers.—A narrow shoal spit making out about 150 yards to the southward from Dutch Island Lighthouse has 6 feet of water near its extremity, where it is marked by a buoy (black, No. 1).

On the south side of the entrance is a high point known as **Fox Hill** which terminates in a bluff rocky face to the northward known as **Beaverhead**. From it a shoal makes out 250 yards to the westward and 400 yards to the northward. At its northern extremity the shoal rises abruptly from 8 $\frac{1}{2}$ fathoms to 7 feet, and is marked by a buoy (red, No. 2).

In the southeastern part of the harbor there is a very shallow cove which makes to the southeastward about $\frac{1}{2}$ mile, and is only separated from Mackerel Cove by a narrow neck of land which joins Beavertail peninsula to the main body of the island.

1 A. *From the Northward.*—Make good a S. by W. $\frac{1}{2}$ W. course for Dutch Island Lighthouse until about 1 mile from the northern end of Dutch Island; the harbor will then be fairly opened and a S. $\frac{1}{2}$ E. course can be steered. Give the northeastern end of Dutch Island a berth of at least 100 yards, and the eastern shore of the harbor a berth of at least 300 yards.

See remarks and dangers under section 1, preceding.

* See footnote on page 104.

APPENDIX I.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

MASSACHUSETTS.

The following extracts are compiled from different Laws of the Commonwealth of Massachusetts as indicated in the marginal references in parentheses: P. S. indicates Public Statutes of 1882.

PILOTS AND PILOTAGE.

Sec. 21. Every pilot shall have for sixty days a lien for his pilotage fees, if approved by the pilot commissioners, upon the hull and appurtenances of every vessel liable to him for such fees under the provisions of this chapter.

Lien of pilots for their fees. (Chap. 70, P. S.)

Sec. 22. Every pilot shall be liable for all damages that may accrue from his negligence, unskillfulness, or unfaithfulness.

Liability of pilots for negligence, etc. (Chap. 70, P. S.)

Sec. 23. Every pilot shall, when required to do so, exhibit his commission to the master of any vessel of which he may take charge.

Pilots to exhibit their commission. (Chap. 70, P. S.)

Sec. 24. No pilot shall, under penalty of suspension or dismissal, take charge of a vessel drawing more water than his commission authorizes.

Not to take charge of certain vessels. (Chap. 70, P. S.)

Sec. 25. Pilots shall first board such vessels (irrespective of size) as may have signals set for a pilot. When there are no such signal to be seen, pilots shall offer their services to the first vessel which they can board; and in case a vessel liable to pilotage refuses to take a pilot, the pilot offering his services shall inform the officers of such vessel that she will be held to pay the regular fees for pilotage, whether such services are accepted or not.

To board first vessel showing signal for a pilot. (Chap. 70, P. S.)

Sec. 26. Every inward-bound vessel shall, except as provided in sections twenty-nine and thirty-two, receive the first pilot, holding a commission for her port of destination, that may offer his services, and such vessels shall, except as provided in sections thirty and thirty-one, be holden to pay to such pilot the regular fees for pilotage, whether his services are accepted or not.

Inward-bound vessels to receive first pilot that offers services. (Chap. 70, P. S.)

Sec. 27. Every outward-bound vessel, which is liable to pilotage if inward-bound, shall, whether the services of a pilot are accepted or not, be held to pay the regular fees to the pilot who brought her into port or to some other pilot of the same boat, if he offers his services before she gets under way; or if such pilot does not so offer, or if such vessel was not piloted into port, then to the pilot who first offers his services.

Outward-bound vessels to pay to pilot who brought it in, etc. (Chap. 70, P. S.)

Sec. 1. Whaling vessels outward-bound from the port of New Bedford shall be exempt from the provisions of section twenty-seven of chapter seventy of the Public Statutes relating to the employment of pilots.

Whaling vessels outward-bound not required to employ a pilot. (Chap. 213, acts of 1884.)

Sec. 28. No vessel shall be liable to pay pilotage fees in or out of any port other than her ports of departure or destination, unless the aid of a pilot is requested, in which case the pilot shall be bound to act as such, and shall be entitled to the regular compensation therefor.

Vessels liable to pilotage only at ports of departure and destination. (Chap. 70, P. S.)

Sec. 29. Every pilot is authorized and directed to take charge, within the limits of his commission, of any vessels, except those exempted from compulsory pilotage

What vessels pilots are to take charge of. (Chap. 70, P. S.)

by section thirty-two, and except also vessels bound from a port within the commonwealth to another port within the same, unless they are in the completion of a voyage from a port or place out of the commonwealth.

Certain vessels liable only for half fees. (Chap. 70, P. S.)

Sec. 30. When vessels of not more than two hundred tons burden decline the services of a pilot, they shall, if otherwise liable under the provisions of this chapter to the payment of pilotage fees, be liable only to one-half of the regular fees; but if they request and receive such services, they shall pay the regular rates.

Vessels taking steam by direction of pilot to pay three-quarter fees. (Chap. 70, P. S.)

Sec. 31. A vessel taking steam by the desire of the master thereof shall pay full pilotage fees; but when steam is taken by direction of the pilot in charge, such vessel shall be held to pay but seventy-five per cent. of the regular fees.

Certain vessels exempt from pilotage. (Chap. 252, acts of 1884.)

Sec. 4. Section thirty-two of chapter seventy of the Public Statutes is amended to read as follows: All passenger steam-vessels regulated by the laws of the United States and carrying a pilot commissioned by United States commissioners, all vessels regularly employed in the coasting trade, all fishing vessels other than whalers, and all vessels of less than seven feet draught of water, shall be exempt from the compulsory payment of pilotage.

Pilot to serve vessels exempt, if so required. (Chap. 252, acts of 1884.)

Sec. 5. Whenever any vessel exempt from the compulsory payment of pilotage requests the aid of a pilot, any pilot so requested shall serve such vessel in like manner as vessels not so exempt, and shall be entitled to the regular compensation therefor.

National vessels to pay full rates when pilot is employed. (Chap. 70, P. S.)

Sec. 33. National vessels, both when inward and when outward bound, shall, if they employ a pilot, pay the same rates as vessels in the merchant service.

Period for winter and for summer rates. (Chap. 70, P. S.)

Sec. 34. Except in the harbor of Boston, winter rates of pilotage shall be allowed from the first day of November to the last day of April, inclusive, and summer rates from the first day of May to the last day of October. In the harbor of Boston the rates of pilotage shall be as now established during the whole year.

Additional fees in case of detention. (Chap. 70, P. S.)

Sec. 35. When a vessel is anchored for twelve hours or more under any regulation relative to quarantine or to alien passengers, the pilot in charge, upon piloting such vessel to her port of destination, shall be entitled to an addition of twenty-five per cent to the regular fees.

Pay of pilot when carried to sea. (Chap. 70, P. S.)

Sec. 36. When a pilot, without any fault or negligence of his own or of his associates, is unable to leave the vessel under his charge, and is carried to sea, he shall be entitled to two dollars for each day on which he is necessarily detained from home.

Anchoring of vessel, with alien passengers or subject to quarantine. (Chap. 70, P. S.)

Sec. 37. Pilots shall, under penalty of suspension or dismission, anchor vessels carrying alien passengers and vessels subject to quarantine at the places assigned for such purposes by the proper authorities.

Persons other than pilots not to act as such, unless, etc. (Chap. 252, acts of 1884.)

Sec. 6. Section thirty-nine of chapter seventy of the Public Statutes is amended to read as follows: No person, who does not hold a commission as a pilot, shall, if a commissioned pilot offers his services or can be obtained within a reasonable time, assume or continue to act as pilot in the charge or conduct of any vessel within the waters of this Commonwealth unless he is a person actually employed on such vessel for the voyage. * * *

Liability, to pilotage fees, of vessels bound into Boston Harbor. (Chap. 252, acts of 1884.)

Sec. 1. Every vessel bound into the harbor of Boston, liable to pilotage, which shall arrive within a line drawn from Harding Ledge to The Graves, and thence to Nahant Head, without having been offered the services of a pilot, shall be exempt from the payment of pilotage fees; but if thereafter she requests and receives such services, she shall pay the regular rates.

Vessels not more than 350 tons, inward bound. (Chap. 252, acts of 1884.)

Sec. 2. Any vessel of not more than three hundred and fifty tons register bound into the port of Boston, declining the services of a pilot, shall, if otherwise liable under the provisions of law to the payment of pilotage fees, be liable only for one-half of the regular fees; but if such vessel request and receive such services she shall be held to pay the regular fees therefor.

Vessels under 350 tons, outward bound. (Chap. 252, acts of 1884.)

Sec. 3. No vessel of under three hundred and fifty tons register, bound out from the port of Boston, shall be held to pay pilotage fees for services tendered and declined; but if such vessel request and receive such services the regular fees shall be paid therefor.

Local regulations, etc., to remain in force. (Chap. 70, P. S.)

Sec. 40. All statutes and regulations relative to pilots and pilotage in particular harbors and places shall remain in force until repealed or altered.

PILOTAGE—SPECIAL REGULATIONS.*

BOSTON HARBOR.

Regulations for the pilotage of the harbor of Boston, and all places or landings accessible to vessels from sea included within the limits of Nahant Rock on the north and Point Alderton on the south.

There shall be not less than six pilot boats constantly employed by the Boston pilots; each boat shall have a number, which shall be painted in black figures of not less than forty-eight inches in length, in the mainsail and jib. * * *

Boston pilots, boats, and regulations.

Each one of the pilot boats employed for the harbor of Boston, in alternate weeks, and in the order of their numbers, shall cruise on a station at the entrance of Boston Harbor, outside of Boston Light, and within the limits of a line drawn from Minots Ledge to Nahant Head, and the boat on said station shall at all times show the established pilot-boat signal, and shall by day and by night, at all times, remain on said station whenever the weather does not render it impracticable, and be on the lookout for vessels approaching Boston Harbor, and shall at all times be furnished with pilots without leaving her station, and shall offer the services of a pilot to all vessels entering said harbor; * * * and she shall receive on board pilots from outward-bound vessels. * * *

It shall be the duty of every pilot, after having brought a vessel to the inner harbor of Boston, to have such vessel properly moored in the stream, or secured to a wharf (below the bridges), at the option of the master, within twenty-four hours after arrival, weather and tide permitting, without extra charge.

If any vessel outward bound, having a pilot on board, should anchor in Nantasket Roads, it shall be the duty of the pilot to remain on board said vessel, if requested by the master, until the next high water, and if detained after that time he shall be entitled to receive three dollars per day for each and every day so detained.

Nantasket Roads.

No pilot shall leave a vessel outward bound, until to the eastward of Georges Island, without permission of the master of said vessel. * * *

Any commissioned pilot that shall offer his services to any vessel bound into the harbor of Boston, without or eastward of a line drawn from Manomet Land, Plymouth, or Thatcher Island, Cape Ann, from the first day of November to the thirtieth day of April, inclusive, shall be entitled to receive twenty per cent in addition to the "foregoing rates." †

The fees for hauling a vessel from the stream to a wharf (below the bridges) after the expiration of twenty-four hours from arrival, shall be four dollars; and for hauling a vessel from the wharf to the stream, provided the vessel does not proceed to sea within twenty-four hours from the time of anchoring, four dollars. * * *

Not less than three pilot boats shall at all times cruise in Boston Bay, outside of the limits prescribed for the station boat.

Every commissioned pilot for Boston Bay shall be attached to a pilot boat. * *

No pilot shall take charge of any vessel of a larger draught of water than his commission authorizes, nor shall any other person, not having a commission, be put on board of any vessel from either of the pilot boats in the capacity of a pilot. But in the event of the master of any vessel taking on board an unauthorized person to assist him in going into port, the person so taken shall state the circumstances to the master of said vessel, and keep the usual signal flying for a pilot until within a line from the Harding Ledge to The Graves and Bass Point, and shall give the vessel up to any authorized pilot who may offer himself. * * *

Draught of vessel not to exceed authority of commission, and only pilot to act, except, etc.

An act to establish a Cape Cod station for Boston pilots.—There shall be two stations for Boston pilots for inward bound vessels. The outer station shall include a distance in sight of land in fair weather from the boat's deck, from where Race Point bears south to where the Highland Light bears west-northwest. The station boat shall at all times show pilot signals, and shall remain on the station until relieved, or compelled by unavoidable circumstances to leave. * * *

Outer station for Boston pilots. (Chap. 276, acts of 1873.)

Station boat to show signals and remain on station until relieved.

The existing regulations of law for the inner station shall also apply to the Cape Cod station created by this act.

Inner station. (Chap. 276, acts of 1873.)

* These regulations, where not otherwise indicated by the marginal references in parentheses, follow the last section of Chapter 176 of the acts of 1862, and form a portion of this act.

† The "foregoing rates" referred to have been changed by Chapter 351 of the acts of 1871 and Chapter 284 of the acts of 1873. The present rates are given on another page of this Appendix.

RATES OF PILOTAGE FOR BOSTON HARBOR.

These are the "winter rates" established by act of legislature in May, 1871, which by the act of May, 1873, became the rates of pilotage for all the year round.

OUTWARD RATES.			INWARD RATES.				
Draught water.	Rate perfoot.	Amount.	Draught water.	Rate perfoot.	Amount.	Distance money.	Amount.
7 feet.	\$1.65	\$11.55	7 feet.	\$2.64	\$18.48	\$3.70	\$22.18
8 "	1.66	13.28	8 "	2.69	21.52	4.30	25.82
9 "	1.67	15.03	9 "	2.73	24.57	4.92	29.48
10 "	1.70	17.00	10 "	2.77	27.70	5.54	33.24
11 "	1.74	19.14	11 "	2.80	30.80	6.16	36.96
12 "	1.78	21.36	12 "	2.85	34.20	6.84	41.04
13 "	2.00	26.00	13 "	2.95	38.35	7.67	46.02
14 "	2.00	28.00	14 "	3.45	48.30	9.66	57.96
15 "	2.10	31.50	15 "	3.50	52.50	10.50	63.00
16 "	2.25	36.00	16 "	3.55	56.80	11.36	68.16
17 "	2.50	42.50	17 "	3.75	63.75	12.75	76.50
18 "	2.75	49.50	18 "	3.80	68.40	13.68	82.08
19 "	3.00	57.00	19 "	4.00	76.00	15.20	91.20
20 "	3.25	65.00	20 "	4.25	85.00	17.00	102.00
21 "	3.50	73.50	21 "	4.50	94.50	18.90	113.40
22 "	3.75	82.50	22 "	4.50	99.00	19.80	118.80
23 "	4.00	92.00	23 "	5.00	115.00	23.00	138.00
24 "	4.25	102.00	24 "	5.00	120.00	24.00	144.00
25 "	5.00	125.00	25 "	5.00	125.00	25.00	150.00

Charles River.—The pilotage on the Charles River, from outside of Charlestown Bridge, in Boston Harbor, shall not be compulsory. When the services of a pilot are required, the rates of pilotage shall be—

From outside of Charlestown Bridge, in Boston Harbor, to Fitchburg Railroad wharf, viz :

10 feet and under	25 cents per foot.
11 to 13 feet	30 cents per foot.
14 feet and upwards	35 cents per foot.

To landings within State Prison Bridge.

11 feet and under	40 cents per foot.
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To Cragies Bridge, including Lowell Railroad wharves.

10 feet and under	35 cents per foot.
11 to 13 feet	40 cents per foot.
14 feet and upwards	45 cents per foot.

To landings between Cragies and Cambridge bridges, including all landings in Cambridgeport.

11 feet and under	40 cents per foot.
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From Cambridge Bridge to Willards Bridge, in addition to the above rates.

11 feet and under	60 cents per foot.
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From Cambridge Bridge to Brighton Corner.

9 feet and under	\$6.00 per vessel.
10 and 11 feet	75 cents per foot.
12 feet	80 cents per foot.
13 feet	85 cents per foot.

The upward and downward rates to be the same. * * *

Mystic River.—The pilotage for Mystic River shall not be compulsory. When the services of a pilot are required, the rates of pilotage shall be, viz: From outside of Chelsea Bridge, in Boston

Harbor, to Charlestown Neck or Malden Bridge, thirty-five cents per foot; to South Malden, fifty cents per foot; from Malden Bridge or either of the railroad bridges to Medford, Malden, or Edgeworth, five dollars per vessel. The upward and downward rates to be the same.

Dorchester and Neponset.—The pilotage for the several landing places in the towns of Dorchester and Neponset shall not be compulsory. When the services of a pilot are required, and are offered outside of a line drawn from the wharf on Thompson Island in a direct line to Dorchester Point, the rates of pilotage authorized by the commissioners shall be, viz: To Commercial Point, thirty cents per foot; to Neponset, forty cents per foot. The inward and outward rates to be the same.

Hingham, Weymouth, and Quincy.—The pilotage for the several landing places in the towns of Hingham, Weymouth, and Quincy, below the bridges, shall not be compulsory. When the services of a pilot are required, and are offered outside of a line drawn from Nantasket Point to the east point of Peddock Island, from thence a line drawn to the northwest point of said Peddock Island, from thence in a line to Sunken Ledge, from Sunken Ledge, in a direct line, to Hangman Island, the rates of pilotage authorized by the commissioners shall be, viz:

INWARD RATES FOR—

EAST WEYMOUTH.			QUINCY POINT.			HINGHAM.		
Draught water.	Rate per foot.	Amount.	Draught water.	Rate per foot.	Amount.	Draught water.	Rate per foot.	Amount.
7 feet.	\$0.88	\$6.16	7 feet.	\$0.72	\$5.04	7 feet.	\$0.92	\$6.44
8 "	.90	7.20	8 "	.72	5.76	8 "	.95	7.60
9 "	.92	8.28	9 "	.72	6.48	9 "	.97	8.73
10 "	.93	9.00	10 "	.80	8.00	10 "	1.00	10.00
11 "	.99	10.89	11 "	.92	10.08	11 "	1.00	10.00
12 "	1.34	16.00	12 "	1.00	12.00	12 "	1.10	13.20
13 "	1.54	20.00	13 "	1.25	16.25	13 "	1.25	16.25
14 "	1.65	23.00						
15 "	2.00	30.00						
16 "	2.50	40.00						
17 "	3.00	51.00						
18 "	3.25	56.00						

Winthrop.—The pilotage for landing places in the town of Winthrop shall not be compulsory, but when the services of a pilot are required and are offered, outside of a line drawn from Point Shirley on the east to the south point of Apple Island on the south, thence in a direct line to Camp Hill Point on the west, the rates of pilotage shall be as follows: For vessels drawing ten feet and under, fifty cents a foot, for vessels drawing over ten feet, sixty cents a foot. Pilotage regulated; fees. (Chap. 114, acts of 1892.)

Lynn.—The pilotage for the harbor of Lynn shall not be compulsory. When the services of a pilot are required, the rates of pilotage shall be, viz: To Lynn, on vessels drawing twelve feet or less of water, three dollars per vessel; to West Lynn, three dollars per vessel. Up the river, through bridges, four dollars per vessel. The outward rates shall be one-half of said inward rates. Lynn.

The established pilot signal by day is a white and blue flag, white next to the mast; and in the night a red light. * * * Signals.

The pilots of the port of Boston shall have an office † or keep a desk in some counting-room, in some central situation, where all communications may be left for them, and it shall be the duty of the pilots, when in Boston, to call at said office or desk twice a day at least. Boston office of pilots.

RAY PILOTAGE—SOUTH SHORE.

The rates for piloting from west of a line drawn from Sakonnet Point to No Mans Land, to the ports herein named, shall be as follows, viz: Into Tarpaulin Cove, one dollar and fifty cents per foot; * * * Falmouth Port, and Holmes Hole, one dollar and seventy-five cents per foot. Into Edgartown and Hyannis, two dollars per foot; and to the bar of Nantucket Harbor, two dollars and twenty-five cents per foot. And into any other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot. Rates west from certain line to places named established.

† The office of the Boston Pilot Association is at Lewis' Wharf, North Pier, Boston.

Outward rates from said ports, etc.

The outward rates of pilotage from all of the above-named ports and from the bar of Nantucket Harbor, if taken westward past Gay Head, shall be three-fourths of the above; and the outward and inward rates shall be increased by twenty per cent for all piloting done between the first day of November and the thirtieth day of April, inclusive.

Rates east of said line to said ports, etc.

The rates for piloting vessels into any of the above-named ports, and to the bar of Nantucket Harbor, from any point east of a line drawn from Sakonnet Point to No Mans Land, and between said line and a line drawn due south from Tarpaulin Cove Lighthouse, shall be twenty-five per cent less than the above-named rates; and if said pilot is taken east of line drawn due south from Tarpaulin Cove Lighthouse, fifty per cent shall be deducted from said specified rates; and in case the master then declines taking a pilot, said pilot offering shall be entitled to one-quarter pilotage, agreeably to these regulations; and if no pilot shall have offered his services before passing a line drawn from the West Chop Lighthouse to the Nobska Lighthouse, there shall be no obligation on the part of the master or owner to pay pilotage if the master shall then decline receiving a pilot.

Vessels from eastward to same ports, etc.

The rates of pilotage for vessels coming from the eastward, bound to the aforesaid ports, shall be from east of a line drawn due north from Nantucket Great Point Lighthouse to the bar of Nantucket, one dollar and fifty cents per foot of said vessel's draught. Into Edgartown and Hyannis, one dollar and seventy-five cents per foot. Into Holmes Hole and Falmouth Port, * * * two dollars per foot; and into all other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot; and from west of said line drawn due north from Great Point Lighthouse, twenty-five per cent less than the foregoing. The outward rates, when passing to sea to eastward of Nantucket Shoals, shall be three-fourths of the inward rates, and both outward and inward rates shall be increased by twenty-five per cent for all pilotage done between the first of November and the thirtieth of April, inclusive.

Pilotage of vessels in and out of Woods Holl Harbor. (Chap. 275, act of 1889.)

Sec. 1. The rates for pilotage for vessels in and out of Woods Holl Harbor shall be as follows: Whenever a pilot shall take charge of a vessel bound into said port from sea, east of a line drawn from Sakonnet Point to No Mans Land, the fees shall be two dollars and twenty-five cents a foot of the vessel's draught. If said vessel takes a pilot east of a line drawn due south from Tarpaulin Cove Lighthouse the fees for pilotage shall be one dollar and twenty-five cents a foot of the vessel's draught. For all pilotage done between the first day of November and the thirtieth day of April twenty-five cents a foot additional shall be charged as winter rates. The outward pilotage from Woods Holl for vessels bound west shall be one dollar and twenty-five cents a foot of the vessel's draught to a line drawn due north from Gay Head Lighthouse. When the pilot is taken east of a line drawn due north from Great Point Lighthouse the fee shall be two dollars and twenty-five cents of the vessel's draught. When the pilot takes charge of a vessel west of a line drawn due north from Nantucket Great Point Lighthouse, bound into Woods Holl, the fee shall be one dollar and twenty-five cents a foot of the vessel's draught; all outward bound vessels from Woods Holl, when bound east over Nantucket Shoals, when taken past and over said shoals, shall be subject to the full fees of two dollars and twenty-five cents a foot of the vessel's draught.

NANTUCKET SHOALS, VINEYARD SOUND, AND PORTS BORDERING THEREON, AND ALSO FOR BUZZARDS BAY, AND HARBORS BORDERING ON ITS WATERS.

Rates.

The rates for piloting vessels through the Vineyard Sound over Nantucket Shoal into Boston Bay, or to any port of destination eastward thereof, if the pilot be taken westward of a line drawn due south from Tarpaulin Cove Lighthouse, or between said line and a line drawn from No Mans Land to Sakonnet Point, from the first day of November to the thirtieth day of April, inclusive, shall be for vessels not drawing more than eleven feet of water, three dollars and fifty cents per foot; if drawing more than eleven feet of water and not more than fourteen feet, four dollars per foot; if drawing more than fourteen feet, four dollars and fifty cents per foot. And from the first day of May to the thirty-first day of October, inclusive, for vessels drawing not more than eleven feet of water, two dollars and fifty cents per foot; if drawing more than eleven feet and not more than fourteen feet, three dollars per foot; if drawing more than fourteen feet, three dollars and fifty cents per foot. And if the pilot be taken west of said line drawn from Sakonnet Point to No Mans Land, ten per cent shall be added to the above specified rates;

and if said pilot be taken at any point east of said line drawn due south from Tarpaulin Cove Lighthouse, ten per cent shall be deducted from said rates; and if, during the navigation aforesaid, the pilot is detained in any port at the request of the master, commander, or owner of said vessel, and not from stress of weather, he shall be allowed three dollars per day for all such detention; and in all cases five dollars shall be added to the rates aforesaid if the vessel shall be taken to a port of destination east of Cape Ann and not eastward of Portsmouth; and if the port of destination be Portsmouth or eastward thereof, ten dollars shall be added to said rates; *provided, however*, that any other rates may be agreed upon, by written contract between the master, commander, or owner of any vessel to be piloted, and the pilot taking charge of the vessel.

The rates of pilotage from one port to another on the Vineyard Sound, including the south coast of Barnstable County, and from the said ports to the bar of Nantucket Harbor, and *vice versa*, shall be uniformly one dollar and twenty-five cents per foot, and twenty-five per cent additional for all pilotage done between the first day of November and the thirtieth day of April, inclusive; and for pilotage inward or outward over the bar of Nantucket Harbor only, at all seasons of the year, one dollar per foot.

Any person holding a commission as pilot for Nantucket Shoals, is authorized to pilot vessels from any part of the Vineyard Sound, Nantucket Shoals, and ports bordering on the waters of the same, to the harbor pilot's limits of any port in Buzzards Bay, or ports west of said bay, at the following rates of pilotage: From any point east of a line drawn due north from Cape Poge, at two dollars per foot of such vessel's draught, and if taken westward of said line drawn due north from Cape Poge, one dollar and fifty cents per foot; and if no port pilot offers his services, with the consent of the master, they may proceed with said vessel to her destination and claim the whole amount of pilotage; *provided, however*, that no vessel passing through the waters of the Vineyard Sound, or over the Nantucket Shoals to ports beyond them, shall be holden to pay compulsory pilotage. But in no case shall an unauthorized pilot take charge of any vessel when a commissioned pilot can be obtained at a proper time. Pilots holding commissions for Vineyard Sound and Nantucket Shoals, who may have piloted a vessel over said shoals whose destination is a port in Barnstable or Boston Bay, or eastward thereof, on arrival at the port of her destination, and no harbor pilot offering his services, may, with the consent of the master (but not otherwise), pilot such vessel into her port of destination and receive the regular port pilot fees therefor.

NEW BEDFORD AND FAIRHAVEN.

Pilots especially commissioned for the purpose shall be authorized to pilot vessels from sea, which are bound into the ports of New Bedford and Fairhaven, to abreast of Clark Point Lighthouse, and to the port pilot limits of other ports in Buzzards Bay (or westward thereof), and if no port pilot offers his services, they may, with the consent of the master or owner, proceed with such vessel to her port of destination, and claim the full amount of pilotage.

The rates of pilotage from sea from vessels bound into the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be one dollar and ninety cents per foot, and from abreast of Clark Point Lighthouse to the inner harbors of New Bedford and Fairhaven, thirty-five cents per foot, and twenty per cent additional to the sea or bay pilotage, from the first day of November to the thirtieth day of April, when a pilot offers his services or is taken west of a line drawn from Sakonnet Point to the south point of No Mans Land.

The outward rates of pilotage from the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be thirty-five cents per foot; from abreast of Clark Point Lighthouse to sea, one dollar and fifty cents per foot.

Vessels bound into other ports (than New Bedford and Fairhaven) in Buzzards Bay, and ports west of said bay, are exempt from paying compulsory bay pilotage, when coming from sea, from westward to the port pilot limits of the several ports; but if a pilot is employed, he shall be entitled to receive two dollars per foot, and if no port pilot offers his services, he may, with the consent of the master or owner, conduct said vessel to the port of her destination and claim the whole amount of pilotage.

The rates of port or harbor pilotage for all the different ports bordering on Buzzards Bay, and to the westward thereof, excepting New Bedford and Fairhaven, shall be for vessels inward bound, drawing less than twelve feet of water, one dollar

Vineyard Sound rates.

Nantucket Shoals, authority of pilot.

Proviso.

Authority of pilots.

Rates.

Vessels to other ports in bay, exemption defined.

Harbor pilotage in bay, except, etc., rates.

per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen and not more than eighteen feet of water, two dollars per foot; and for those drawing over eighteen feet of water, two dollars and fifty cents per foot; and the rates of pilotage for vessels outward bound from said ports shall be three-quarters of said inward rates, and both outward and inward rates shall be increased by twenty per cent for all pilotage done between the first day of November and the thirtieth of April, inclusive.

NEWBURYPORT, MERRIMACK RIVER AND HARBORS, ROCKPORT, LANES COVE, AND ANNISQUAM, GLOUCESTER, SALEM AND BEVERLY, MARBLEHEAD, COHASSET, PLYMOUTH, PROVINCETOWN, TAUNTON RIVER.

Newburyport.

Newburyport.—The rates of pilotage for vessels liable to pay pilotage bound into or out of the harbor of Newburyport shall be, for outward bound vessels, from seven to twelve feet draught of water, sixty-five cents per foot; from twelve to fifteen feet, inclusive, eighty-five cents per foot; upwards of fifteen feet, one dollar and five cents per foot. The summer rates of pilotage for inward bound vessels, drawing from seven to under twelve feet, ninety-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and twenty-five cents per foot; over fifteen feet, one dollar and sixty cents per foot. The winter rates of pilotage for inward bound vessels, drawing from seven to 12 feet of water, one dollar and twenty-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and sixty-five cents per foot; over fifteen feet, two dollars and ten cents per foot.

Limits of district.

The district limits of the port of Newburyport shall be from Chebacco Bar, on the south, to the Isles of Shoals, on the north. Vessels not spoken until within the bar shall pay only half pilotage; if not spoken until within the Black Rocks shall pay no compulsory pilotage.

Boats.

The pilots of Newburyport will be required to keep one or more * * * boats, and one boat shall be upon the cruising ground at all times, when the weather will permit.

Merrimack River and Harbors.

Merrimack River and Harbors.—The pilotage on the Merrimack River, between Newburyport and Haverhill, shall not be compulsory. When the services of a pilot are required, the rates of pilotage authorized by the commissioners shall be, between Newburyport and ship-yards at Bellville, thirty cents per foot; between Newburyport and Salisbury, fifty cents per foot; between Newburyport and Amesbury, sixty-two and one-half cents per foot; between Newburyport and Groveland, eighty-seven and one-half cents per foot; between Newburyport and Haverhill, one dollar per foot.

Rockport, Lanes Cove, and Annisquam.

Rockport, Lanes Cove, and Annisquam.—The rates of pilotage shall be, for vessels under twelve feet draught of water, seventy-five cents per foot; of twelve to fifteen feet, inclusive, one dollar per foot; over fifteen feet, one dollar and fifty cents per foot. The inward and outward rates shall be the same.

Rates for pilotage into Gloucester Harbor. (Chap. 228, acts of 1873.)

Gloucester.—**Sec. 1.** The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Gloucester, shall be for vessels drawing seven feet and less than twelve feet, one dollar and fifty cents per foot; for those drawing twelve feet and upwards, the same as for the ports of Salem and Beverly.

Salem and Beverly.

Salem and Beverly.—The pilots for the ports of Salem and Beverly shall keep one or more good decked boats, and shall cruise for the purpose of bringing vessels into said ports whenever the weather does not render it impracticable.

The harbor lines of the ports of Salem and Beverly shall be a line running north by east from Half-Way Rock to the northern shore, and a line running northwesterly from Half-Way Rock to Marblehead Fort, within which lines there shall be no compulsory inward pilotage. The rates for pilotage, both for inward and outward bound vessels, shall be as follows, viz: * * *

Rates of pilotage for ports of Salem and Beverly to be same as for Boston. (Chap. 204, Supp. to P. S.)

Sec. 1. The rates of pilotage for the ports of Salem and Beverly shall hereafter be the same as those established for outward and inward bound vessels for the port of Boston.

* * * Any Salem and Beverly pilot, having brought a vessel in, shall have such vessel properly moored in the harbor or secured at the wharf, at the option of the master, within twelve hours after the arrival of said vessel, if the weather permits, without extra charge; but if called upon after the expiration of the twelve hours to haul any vessel into the wharf, the pilot shall be entitled to receive two dollars for his services, and the same sum for taking a vessel from the wharf into the harbor, if said vessel shall not proceed to sea within twelve hours from the time of her being anchored in the harbor. The signal for the pilot boats for

the ports of Salem and Beverly shall be their accustomed signal by day, viz, a red flag with a white P, and a black ball painted on the upper part of mainsail and jib; and by night a green light.

Marblehead.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Marblehead shall be, for vessels drawing from seven to eleven feet of water, sixty-seven cents per foot; from twelve to fourteen feet, ninety cents per foot; from fifteen to seventeen feet, one dollar and twenty cents per foot; eighteen feet and upwards, one dollar and sixty cents per foot.

The harbor limits of Marblehead shall be bounded by a line drawn from the south point of the Neck to Marblehead Rock, thence to Cat Island Rock, and thence westerly to Gerrys Island; within this line there shall be no compulsory inward pilotage. The outward rates shall be the same as the inward.

Cohasset Harbor.—The rates of pilotage for said harbor shall be the same for outward and inward bound vessels as those established for the harbor of Boston.

Marblehead.

Pilot for Cohasset Harbor. (Chap. 298, Supp. to P. S., Sec. 2.)

Plymouth.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Plymouth shall be one dollar per foot. Vessels arriving inside of the Gurnet, and no pilot previously offering his services, are exempt from compulsory pilotage, if a pilot's services are then refused. Rate of pilotage outward, seventy-five cents per foot.

Plymouth.

Provincetown.—There shall be commissioned from the port of Provincetown not more than six persons, who shall be competent as bay and harbor pilots, and who shall keep a * * * boat, * * * and shall cruise in all seasons, for the purpose of taking vessels into Provincetown or Cape Cod Harbor. Said pilots shall also be entitled to take vessels, when outside the limits of the line hereinafter defined, to or within said limits, or until spoken by a Boston pilot. Vessels bound into the port of Boston, and liable to pay pilotage, will take such pilots, when first spoken by them, and said pilots shall have authority to pilot any such vessels until spoken by a Boston pilot, when the vessel shall be given up to the first pilot commissioned for the port of Boston who may hail her; but the cape pilot shall continue on board until relieved by a Boston pilot, to whom the vessel shall be given up; and the pilotage of such vessel shall be divided between the two pilots, *pro rata*, in proportion to the distance each may have charge of her, after passing a line drawn from Plymouth Lights to Thatcher Island, Cape Ann, in which event distance-money shall be wholly for the benefit of the cape pilots—otherwise for the Boston pilots; but the compensation of the first pilot shall in no case be less than five dollars, which amount shall be deducted from the regular pilotage, so that in no instance shall there be any addition to the usual rates of pilotage in consequence of taking such cape pilots.

Bay and harbor pilots, six; appointment and duties.

The limits outside of which such Cape Cod or Provincetown pilots may take a vessel bound into Boston shall be a line drawn northeast from the Gurnet or Plymouth Lights; but all commissioned pilots for the port of Boston shall have the privilege of cruising outside of said line, as heretofore.

Cape Cod and Provincetown pilots.

Vessels coming by Cape Cod and bound for the ports of Salem, Beverly, or Marblehead, who may desire the services of a cape pilot, may take such pilot as may be competent, to the several ports or pilots, under the same restrictions as are provided for vessels bound to Boston, as above.

Vessels via cape, for Salem, etc.

The rates of pilotage for all vessels liable to pay pilotage bound into the harbor of Provincetown, if taken south of a line drawn due west from Race Point Light-house, or between that and a line drawn due south from Wood End Bar, shall be for vessels drawing less than twelve feet of water, one dollar per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen feet and not more than eighteen feet of water, two dollars per foot; for those drawing more than eighteen feet and not more than twenty-one feet of water, two dollars and fifty cents per foot; for those drawing more than twenty-one feet and not more than twenty-five feet of water, three dollars and fifty cents per foot, and no more. But no vessel shall be liable to pay compulsory pilotage if the services of a pilot are refused after passing a line drawn due south from Wood End Bar. And the outward rates of pilotage shall be three-fourths the amount of said inward rates.

Rates for vessels bound to Provincetown, taken south of line west from Race Point.

Taunton River.—The pilotage for Taunton River shall not be compulsory. When the services of a pilot are required, the rates of pilotage on all vessels piloted from Fall River to Somerset, drawing not over twenty feet of water, is two dollars. From Fall River to Dighton, on vessels drawing twelve feet of water, seven dollars; eleven feet, six dollars and fifty cents; ten feet, six dollars; nine feet, five dollars and fifty cents; eight feet, five dollars; under eight feet, four dollars. From Somerset

Taunton River.

to Dighton and Berkley, fifty cents per foot for vessels drawing from eight to twelve feet of water; under eight feet, three dollars per vessel. The downward pilotage from the aforesaid places shall be one-half of the upward rates.

HARBOR CONTROL.

Penalty for boarding
without leave.
Vessels arriving. (Chap.
69, P. S.)

Sec. 5. Any person, except a pilot or public officer, who boards or attempts to board a vessel arriving in Boston Harbor, Salem Harbor, Fall River Harbor, or the harbor of New Bedford and Fairhaven, before such vessel has been made fast to the wharf, without obtaining leave from the master or person having charge of such vessel, or leave in writing from its owners or agent, shall forfeit a sum not exceeding fifty dollars for each offense.

For boarding vessels
when forbidden, or refus-
ing to leave when ordered
to do so. (Chap. 69, P. S.)

Sec. 6. Whoever, without such leave and without authority of law, boards a vessel in either of said harbors after having been ordered not to do so by a person having charge of such vessel at the time, and whoever, having boarded such vessel, refuses or neglects to leave it when ordered so to do by the person having charge of it, shall forfeit a sum not exceeding fifty dollars.

Harbor limits. (Chap.
69, P. S.)

Sec. 11. For the purposes of the six preceding sections, the outer limits of Boston Harbor, for vessels bound thereto, shall be a line drawn from Harding Ledge to the Outer Graves, and from thence to Nahant Head, and said harbor shall include the shores of Chelsea; the outer limits of Salem Harbor, for vessels bound thereto, shall be the chops of said harbor; the harbor of Fall River shall include the waters of Taunton Great River and Mount Hope Bay, from the south line of the town of Freetown to Rhode Island state line, including the shores of Somerset; and the harbors of New Bedford and Fairhaven shall be considered one harbor, the outer limits of which, for vessels bound thereto, shall be the outer limits of Buzzards Bay.

Protection of harbors
and navigable waters.
(Chap. 209, acts of 1884.)

Sec. 1. Whoever wilfully and without lawful authority or license therefor, throws into or deposits in a harbor or other navigable tide-waters, stones, gravel, mud, ballast, cinders, ashes, dirt, or any other substance which may in any way tend to injure the navigation of such harbor or other waters, or to shoal the depth thereof, shall be punished by a fine not exceeding twenty dollars for each offense.

No warp or line to be
passed across a channel or
dock. (Chap. 69, P. S.)

Sec. 24. No warp or line shall be passed across a channel or dock so as to obstruct vessels passing along the same.

Vessels to be anchored
according to rules of the
harbor master. (Chap. 69,
P. S.)

Sec. 26. Every master of a vessel within a harbor for which a harbor master is appointed shall anchor his vessel according to the rules and regulations of the harbor master, and shall move to such other place as the harbor master may direct; and every master of a towboat having a vessel in tow, and every pilot having a vessel in charge, shall allow such vessels to anchor only in such place as the rules and regulations of the harbor master provide for anchorage.†

Powers of harbor mas-
ters. (Chap. 69, P. S.)

Sec. 27. Every vessel, before unloading lumber in the stream or channel of a harbor having a harbor master, shall obtain a permit from such harbor master, designating where such lumber may be rafted, so as to avoid obstructing the channel or hindering the movements of other vessels.

Same subject. (Chap.
69, P. S.)

Sec. 28. Every vessel lying in a harbor or at a wharf or pier in a harbor shall, when directed by the harbor master thereof, cockbill the lower yards, brace the top-sail yards fore and aft, and rig in the jib-boom.

Harbor master may re-
move any vessel not mov-
ing when directed. (Chap.
69, P. S.)

Sec. 29. A harbor master may cause the removal of any vessel lying in his harbor and not moving when directed by him so to do, and the expense of such removal shall be paid by the master or owners of such vessel.† * * *

May require removal of
vessels lying at a wharf,
etc. (Chap. 69, P. S.)

Sec. 30. If a vessel occupying a berth at a wharf or pier, either with or without the consent of the wharfinger thereof, fails, upon notice from such wharfinger or his agent to the master or to those having such vessel in charge for the time being, to vacate such berth in a reasonable time, to be adjudged by the harbor master, the harbor master shall then cause such vessel to be moved to some other berth or anchored in the stream, and the expense of such removal may be recovered * * * by the harbor master from the master or owners of such vessel. * * *

May regulate and sta-
tion vessels, etc. (Chap.
69, P. S.)

Sec. 31. Harbor masters may, in their respective harbors, regulate and station all vessels in the stream or channels thereof, and may remove such as are not employed in receiving or discharging their cargoes, to make room for such others as require to be more immediately accommodated for the purpose of receiving or discharging their cargoes; and as to the fact of their being fairly and actually employed in receiving or discharging their cargoes, the harbor master shall determine.

† As amended by Chap. 173 of the acts of 1894.

Sec. 1. No vessel which shall cast anchor in the harbor of Boston, between India Wharf and Grays Wharf, shall anchor within five hundred feet of the line described in the second section of an act entitled "An act to preserve the harbor of Boston, and to prevent encroachments therein," passed on the nineteenth day of April, in the year one thousand eight hundred and thirty-seven; and no vessel which shall cast anchor between the easterly side of Lamsons Wharf and the easterly side of Tuttle's Wharf, at East Boston, shall anchor within five hundred feet of the line described in the fifth section of "An act concerning the harbor of Boston," passed the seventeenth day of March, in the year one thousand eight hundred and forty, unless for the purpose of hauling in, as soon as practicable, to some wharf in said harbor, or unless compelled to do so by reason of stress of weather or unavoidable casualty. * * *

Anchorage to be only within certain limits. (Chap. 234, acts of 1847.)

Provided, etc.

Sec. 4. All vessels at anchor in the harbor of Boston shall keep an anchor watch at all times, and shall keep a clear and distinct light, suspended at least six feet above the deck, during the night. * * *

Concerning anchor watch and lights at night. (Chap. 314, acts of 1848.)

Sec. 1. No vessel propelled by steam shall, either in Boston Harbor or Charlestown Harbor, pass within one hundred yards of any wharf at greater speed than at the rate of five miles an hour.

Steam vessels not to pass wharves faster than five miles an hour. (Chap. 16, acts of 1872.)

Sec. 1. That the mayor and aldermen of the city of Gloucester may appoint a harbor master for the harbor of said city. * * *

Harbor master to be appointed.

He may appoint a deputy whenever the mayor and alderman deem it necessary. * * * He and his said deputy shall have the powers and duties, and shall enforce the regulations and penalties set forth in the last twelve sections of chapter sixty-nine of the Public Statutes, and in this act, and in any other laws which are or may be in force applicable to said office and to said harbor. * * *

May appoint a deputy. (Chap. 315, acts of 1885.)

Sec. 2. From Tenpound Island to Fivepound Island, a sufficient passageway of not less than two hundred feet in width on the northerly side of said harbor, leaving Babson Ledge buoy on the port hand going in, and a passageway of not less than one hundred and fifty feet in width from any wharf in Upper Cove, Smiths Cove, and Harbor Cove in said harbor, shall be at all times kept open for the passageway of vessels; and no vessel shall be anchored or allowed to lie at anchor in said passageways or in the track of the ferryboats regularly running in said harbor.

Certain passageway to be kept open. (Chap. 315, acts of 1885.)

Sec. 3. At least one man shall at all times be kept on board each vessel at anchor in said harbor; and a clear and distinct light shall be kept suspended not less than six feet above the deck of every such vessel during the night.

A man to be on board each vessel; light, etc. (Chap. 315, acts of 1885.)

BOSTON HARBOR.

Harbor Regulations.—The regulations governing this harbor are given in the extracts from Laws of the Commonwealth of Massachusetts, on pages 130 and 131; and the rules of the harbor master in regard to anchorages are as follows:

1. All vessels anchoring on the south side of the channel must anchor by the following marks, viz: The twin towers of St. Mary's Church on Thatcher street, in range with granite block on Long Wharf, and southeast of a line drawn between the elevators in East and South Boston, and all vessels anchoring to the westward of this line will be removed at once.

2. All vessels anchoring on the north side of the channel must anchor by the following marks, viz: The Long Island Light in range with the Half Moon Battery on Governors Island, and southeasterly of the range of the elevators in East and South Boston.

3. All vessels anchoring northwest of North Ferry and southeast of Chelsea Ferry will anchor by the following marks, viz: The steeple on Mutual Life Insurance Building, Milk street, in range of west end of granite block on Union Wharf and southwest of the Boston Dye Wood Company's Wharf, East Boston.

4. Small vessels will anchor inside the above ranges, in order that sufficient room may be given for larger vessels.

5. No vessel, after having discharged its cargo and dropped down through the Charles River draw, shall anchor above a line drawn from Fiske's South Wharf to Water Battery in Navy Yard.

6. No vessel shall lie at anchor in the track of the ferryboats, or in Fort Point Channel.

7. No more than two vessels at a time will be allowed to anchor between the East Boston ferries.

8. All vessels anchoring below Charles River Bridge, bound up, will anchor as near the Boston side as practicable.

9. A master of a towboat having a vessel in tow, or a pilot having a vessel in charge, will allow such vessel to anchor only as provided in the above rules and regulations.

10. Any master of a vessel wishing to discharge part of his cargo before going into dock, must notify the harbor master in order that a berth may be assigned therefor, and obtain permit.

APPENDIX I.

QUARANTINE.

Towns may establish a quarantine ground.

Board of health may establish the quarantine of vessels.

Vessels suspected of infection to be ordered to quarantine ground.

Penalty if master, seaman, etc., refuse to answer on oath.

Quarantine expenses to be paid by person or owner.

Sec. 62. A town may establish a quarantine ground in a suitable place. * * *

Sec. 64. The board of health in each sea-port town may from time to time establish the quarantine to be performed by vessels arriving within its harbor, and may make such quarantine regulations as it judges necessary for the health and safety of the inhabitants.

Sec. 67. The board in each sea-port town may at any time cause a vessel arriving in such port, when such vessel or the cargo thereof is in its opinion foul or infected so as to endanger the public health, to be removed to the quarantine ground and thoroughly purified at the expense of the owners, consignees, or persons in possession of the same; and may cause all persons arriving in or going on board of such vessel, or handling the cargo, to be removed to any hospital under the care of the board, there to remain under their orders.

Sec. 68. A master, seaman, or passenger belonging to a vessel on board of which any infection then is or has lately been, or is suspected to have been, or which has been at or has come from a port where an infectious distemper prevails that may endanger the public health, who refuses to make answer on oath to such questions as may be asked him relating to such infection or distemper by the board of health of the town to which such vessel may come (which oath any member of the board may administer), shall forfeit a sum not exceeding two hundred dollars; and if not able to pay said sum, he shall suffer six months' imprisonment.

Sec. 69. All expenses incurred on account of any person, vessel, or goods, under quarantine regulations, shall be paid by such person or the owner of such vessel or goods, respectively.

RHODE ISLAND.

PILOTS AND PILOTAGE.

(Extracts—Chap. 99.*)

Duties of pilots.

Sec. 3. Every pilot shall take charge of all registered vessels entering the ports or waters of the State, or going out of the same, except fishing vessels not whaling vessels, coastwise vessels, vessels sailing from one port to another within the State and not in completion of a voyage from a place out of the State; and passenger steam vessels regulated by United States laws and carrying a United States pilot.

Vessels liable for pilotage fee, when.

Sec. 4. Every vessel inward bound, other than those included in the exception in the preceding section, shall pay to the pilot offering his services the regular pilotage fee; but coastwise vessels not taking a pilot shall be exempt therefrom: (provided), however, that no vessel shall be obliged to take a pilot or to pay pilotage if she is bound into the harbors of Newport, Bristol, or Warren, unless a commissioned pilot shall offer his services before such vessel passes the line from Point Judith to Brenton Reef light-vessel.

Pilotage fees, a lien on vessels.

Sec. 5. Every pilot shall have a lien for his pilotage fees for the space of sixty days upon the hull and appurtenances of any vessel liable to him therefor.

Coastwise vessels may refuse pilots.

Sec. 6. Coastwise vessels shall not be required to take a pilot, but if they elect to take a pilot, the pilotage shall be the same as for registered vessels.

Rules for pilots and pilotage, etc.

Sec. 9. The commissioners may from time to time make rules and regulations concerning pilots and pilotage and fixing the rates of pilotage.

* * * * *

Rates of pilotage for vessels taking steam towage.

Sec. 11. Vessels taking steam towage into or out of a port or harbor of the State by direction of the owner or master shall pay full pilotage; but whenever steam towage is taken by request of the pilot the vessel shall be liable to pay only seventy-five per centum of the rates of pilotage to which such vessel would otherwise be liable.

Rates of Pilotage fixed by the Pilot Commissioners.

The rates to all ports in Rhode Island except Newport and Dutch Island are as given in the following table:

Draught.	Rate per foot.	Total.	Draught.	Rate per foot.	Total.	Draught.	Rate per foot.	Total.
7½ feet and under....	\$1.25	\$9.37	11½ feet.....	\$1.75	\$20.12	15½ feet.....	\$2.75	\$42.62
8 ".....	1.50	12.00	12 ".....	2.00	24.00	16 ".....	3.00	48.00
8½ ".....	1.50	12.75	12½ ".....	2.00	25.00	16½ ".....	3.00	49.50
9 ".....	1.50	13.50	13 ".....	2.25	29.25	17 ".....	3.25	55.25
9½ ".....	1.50	14.25	13½ ".....	2.25	30.37	17½ ".....	3.25	56.87
10 ".....	1.75	17.50	14 ".....	2.50	35.00	18 feet and over....	3.50	63.00
10½ ".....	1.75	18.37	14½ ".....	2.50	36.25			
11 ".....	1.75	19.25	15 ".....	2.75	41.25			

The rates to Fall River, Mass., are the same as given above.

To Newport and Dutch Island the rates are as follows: 10 feet draught and under, \$1 per foot; 10½ to 12 feet, \$1.50 per foot; 12½ to 15 feet, \$2 per foot; 15½ to 20 feet, \$2.50 per foot; 20½ feet and over, \$3 per foot.

The outward rates of pilotage for all ports in Rhode Island are the same as the inward rates.

HALF RATES.

If bound into Wickford and past the range of Fox Island and the Beacon, half the regular rates of pilotage.

If bound to East Greenwich or Apponaug (so called) and past the range of the Beacon and Warwick Neck Lighthouse, half of the regular rates of pilotage.

If bound to Providence and past the line of Warwick Neck Lighthouse and Popposquash Point, half of the regular rates of pilotage.

If bound into Mount Hope Bay and past Sandy Point Lighthouse, half of the regular rates.

WINTER RATES.

From November 1 to May 1, 50 cents per foot extra in addition to the foregoing rates.

No vessel bound to Providence shall be compelled to take a pilot unless spoken by a branch pilot below Nayatt Point; or if bound to East Greenwich or Apponaug, below Warwick Neck and the Spindle; or Mount Hope Bay, below the pyramid at Bristol Ferry.

Pilots shall not charge for less than 4 inches of water, but when a vessel draws 4 inches, then the pilot shall charge for the half foot.

PROTECTION TO NAVIGATION.

[Extracts—Chapter 100. *]

Sec. 5. No person shall throw * * * into the waters of Providence River or Seekonk River or Narragansett Bay north of a line drawn from Nayatt Point to Rocky Point any cinders or ashes from any steamboat. Throwing cinders, etc., from steamboats in certain waters forbidden.

Sec. 7. No person shall deposit any mud, earth, sand, gravel, ashes, cinders, or other substances in the main channel of Providence River leading to the city of Providence, or in any part of the said river or of Warren River or of Narragansett Bay lying east of the said Main Channel and north of a line drawn east and west across the said channel, and from the easterly line thereof to the eastern shore of the said bay, in the range of the lower buoy off Rumstick Point, or in the waters of Narragansett Bay, within one mile of the shores of Bristol County or Hog Island. Dumping of mud, etc., into Providence River, Warren River, and portions of Narragansett Bay, forbidden.

* * *

QUARANTINE.

[Extracts—Chapter 82. †]

Sec. 1. Each seaport town, or the town council thereof, may appoint a health officer. * * * Health officer in seaport towns; his duties and compensation.

* See footnote on page 132.

† See footnote on page 132 and also "National Quarantine."

To designate place of anchorage, define quarantine limits, etc.

Sec. 4. They shall designate the particular place in the harbor, bay, or river adjacent to such town, where all ships or vessels arriving, subject to examination or quarantine, shall come to anchor, and shall define the limits of such quarantine ground, and assign the time for which such ships or vessels shall be detained, and where and how unladen.

Penalty for neglect to anchor.

Sec. 6. Every commander of a ship or vessel who shall * * * refuse or neglect to bring his ship or vessel to anchor within the limits as above described, shall be fined not exceeding five hundred dollars nor less than twenty dollars, to the use of the town.

Penalty for leaving quarantined vessel.

Sec. 8. Every person who shall leave any ship or vessel under order of quarantine, without permission from the health officer or the town council of such town, shall be fined not exceeding twenty dollars. * * *

Of vessels bound to Providence.

Sec. 9. If any vessel shall arrive in the waters of the State, bound to the port of Providence, at any time while the quarantine regulations of the city of Providence are in force, no person on board such vessel shall leave the same until such vessel shall have been visited and examined by the health officer. * * *

REGULATIONS FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES.

[Extracts—Chapter 81.*]

Vessel infected, where to anchor, etc.

Sec. 1. Every commander of any vessel which shall come into any port or harbor of the State, and shall have any person on board sick of the smallpox or any other contagious or infectious distemper or which has had any person sick of such distemper during the passage to such port or harbor, or shall come from any port or place usually infected with the smallpox, or where any other contagious or infectious distemper is prevalent, who shall bring such vessel to anchor in any of the ports or harbors of the State within the distance of one mile from any public ferry, pier or landing place, or permit or suffer any person on board such vessel to be landed or any person to come on board such vessel without a license first had and obtained from the town council of the town where such vessel shall arrive, shall be fined four hundred dollars.

License required to go on, or from.

Signals to be kept in shrouds.

Sec. 2. Such commander, on his arrival in any of the waters of the State, shall forthwith hoist and keep his colors in the shrouds of such vessel, as a signal that he has come from some such infected place or has infection or contagion on board.

Penalty for leaving such vessel.

Sec. 3. If any person shall come on shore from on board such vessel, without license first had and obtained as aforesaid, the town council may send back such offender immediately on board such vessel, or confine him on shore in such convenient place as to them shall appear most effectual to prevent the spreading of any infection; and the person so offending shall satisfy and pay all charges that shall arise thereon, and shall also be fined forty dollars.

Powers of health officer of Newport.

Sec. 32. The health officer of the city of Newport shall * * * have authority * * * in all matters arising under this chapter in relation to any vessel coming within Dutch Island Harbor or within the waters of the East River† below the bridges between Portsmouth and Tiverton.

NEWPORT, R. I.

Harbor Regulations.—The following extracts are from the City Ordinances:

(Extracts—Chapter 17.)

Vessels entering harbor to be anchored under directions of harbor master.

Sec. 1. All vessels entering the harbor shall be anchored by the master or commander thereof, according to the directions of the harbor master.

Of vessels not so anchored.

Sec. 2. All vessels lying in the harbor, not anchored according to the directions of the harbor master, and not having sufficient crew to move them, shall be moved by the harbor master.

Powers of harbor master.

Sec. 3. The harbor master shall have authority to remove such vessels as are not employed in receiving or discharging their cargoes, he being sole judge as to the fact of their being fairly or properly employed in receiving or discharging their cargoes; and he also, for any purpose in his discretion, may move or order or cause to be moved any vessel lying anywhere in the harbor, whether at a wharf or elsewhere.

(Extracts—Chapter 39.)

Speed of steamboats in inner harbor not to exceed 5 miles per hour.

Sec. 1. It shall be the duty of the captain or engineer of every ship or boat which is propelled by steam, to cause the speed of his said ship or boat while passing

*See footnote on page 132.

†Sakonnet River.

through the inner harbor of said city, between the lighthouse on Goat Island Breakwater and the south end of Goat Island, to be regulated to not exceeding the rate of five miles an hour.

Quarantine.—The following extracts are from Chap. 18 of the City Ordinances :

Sec. 1. A quarantine shall be had of all vessels, their officers, crews, passengers and cargoes that come within the harbor of Newport, which are from any port or place whatever where any infectious, contagious or malignant disease prevails, or recently has prevailed, or which are foul or infected after their arrival; no vessel coming from any infected district, or on board which, during her voyage, any person may have died of an infectious disease, or whose cargoes or any part thereof has recently been brought from any such port or place, shall be unladen of any article which may be deemed by the health officer capable of generating or communicating disease. * * *

What vessels, etc., subject to quarantine.

Sec. 2. The quarantine ground of the city of Newport shall comprise those portions of the harbor of Newport which lie to the northward of the lighthouse on the breakwater of Goat Island and to the southward of Coasters Harbor Island, and west of a straight line drawn from said lighthouse to the western part of said Coasters Harbor Island. * * *

The quarantine ground.

All vessels that may be ordered into quarantine shall during the time they remain in quarantine wear a color in their shrouds in such manner as to be seen at a safe distance.

Sec. 3. During the time any vessel is performing quarantine, no person shall go on board thereof. * * *

No one to visit quarantined vessels except, etc.

Sec. 4. It shall be the duty of the sentinel to board every vessel arriving at this port between the 30th day of June and the 1st day of November of any year, and examine their condition, and if such vessel is liable to quarantine, to order said vessel to the quarantine ground and deliver the captain or commanding officer a copy of these regulations. * * *

Duties of sentinel of quarantine.

Sec. 9. All vessels arriving at this port, after having discharged their cargoes in any other port of the United States, agreeably to the quarantine regulations of such port, shall anchor on the quarantine ground, and be visited and examined by the said health officer, and be subject to the provisions of the first section of this chapter, the same as if said vessel came direct to this port.

Of vessels coming from other quarantine ports.

Sec. 12. The said health officer shall have authority to put such interrogatories and inquiries to the captain or commanding officer, or any other person on board of any vessel arriving at this port and subject to quarantine, as he shall deem proper. * * *

Powers of inquiry of health officer.

PROVIDENCE, R. I.

Harbor Regulations.—The following are extracts from Chap. 22 of the City Ordinances :

Sec. 1. The harbor master shall have full power and authority to prescribe regulations and give directions regarding the anchorage station, management and control of all vessels within the harbor of Providence.

Sec. 2. Every vessel entering said harbor shall be anchored by the master or person in command thereof, according to the directions of the harbor master.

Sec. 3. All vessels not anchored according to the directions of the harbor master shall be forthwith moved by their crews under his direction; and if any such vessel have not sufficient crew to move the same, such vessel shall be moved by the harbor master. * * *

Sec. 4. No warp or line shall be passed across the channel so as to obstruct the passage of vessels passing along the same.

Sec. 5. Vessels shall not in any case be placed alongside of any wharf in said harbor more than three deep, without permission of the harbor master.

Sec. 6. The master, owners or persons in charge of any square-rigged vessel shall, as soon as may be after such vessel is made fast to any wharf or other vessel, cause the lower yards to be cockbilled, and the topsail yards to be braced fore and aft; and the jib-boom of any vessel shall be rigged in whenever so directed by the harbor master.

Sec. 7. The harbor master may remove * * * any vessel not employed in receiving or discharging cargo, * * * and shall be sole judge of the fact of any vessels being fairly and legitimately engaged in the receiving or discharging of cargo. He may also determine the extent, time and manner of accommodation respecting the stations of vessels, which should be extended by the owners or masters thereof to each other, and to require such accommodation to be extended.

Sec. 8. The master. * * * of every vessel intending to unload [lumber] in the streams shall first obtain from the harbor master a permit designating the locality where such lumber may be rafted; but no vessel shall obstruct the channel in so doing.

Sec. 9. Every vessel drawing more than ten feet of water, and approaching the harbor at any other than high tide, shall anchor below "The Crook" (so-called) until the tide shall warrant a free passage.

Sec. 10. No steamboat shall proceed at a greater speed than five miles an hour, between "The Crook" and Weybosset bridge, in entering or leaving or moving within the harbor.

Quarantine.—The following are extracts from the regulations adopted by the Board of Aldermen :

1. The quarantine ground of the port of Providence shall comprise that portion of the harbor lying eastward of the main channel of Providence River, and extending from Fields Point to Sassafras Point.

2. Every vessel arriving in the harbor of Providence that shall have on board, or that shall have had on board during the passage, any person sick with fever of any description, with cholera, smallpox, or other contagious or infectious disease, and every vessel that shall be subject to quarantine under any order or rule that may be established from time to time by the board of alderman, shall anchor at the quarantine ground ; and the person in command of such vessel shall place in the main shrouds thereof a flag as signal, and such vessel shall remain at anchor at said ground with the flag in the shrouds, until written permission shall have been given for such vessel to leave by the health officer.

4. All vessels arriving at the port of Providence, and subject to quarantine under the preceding rules and regulations, shall anchor at the quarantine ground and be subject to examination and quarantine, though they may have called at, or discharged their cargoes at any other port in the United States.

5. The health officer may demand such information, and ask such questions as he shall deem necessary or proper, of the captain or commanding officer, or other person on board of any vessel arriving at this port and subject to quarantine, respecting the condition of such vessel and the health of the persons on board the same. * * *

6. If any vessel in the harbor of the city, whether subject to quarantine or not, shall have any sickness on board, or if such vessel or the cargo thereof is in a condition dangerous to the public health, in the opinion of the health officer, said health officer may subject such vessel to the regulations of quarantine, so far as in his opinion may be necessary to prevent all such danger.

8. No provisions, spirituous liquors, or other articles shall be permitted to be brought on board any vessel at quarantine without the written permission of the health officer.

9. No portion of the cargo, personal baggage, clothing, or other goods shall be delivered from on board any vessel at quarantine, except in such manner and at such places as the health officer shall in writing direct.

10. No person in any boat or vessel shall go alongside of any vessel at quarantine, nor be at anchor or remain within one hundred yards of such vessel at quarantine, without written permission from the health officer.

11. Every vessel at quarantine shall be stationed at such place as the health officer shall direct.

Resolved, That all vessels sailing from European, Asiatic, or cholera infected ports shall be subject to quarantine, and such vessels shall anchor below a line drawn from Conimicut Point to Nayat Point, until inspected by the superintendent of health. (Sept. 6, 1892.)

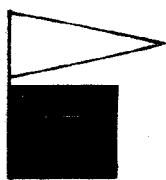
APPENDIX II.

WIND SIGNALS OF THE U. S. WEATHER BUREAU.

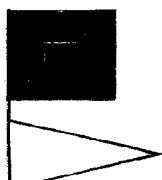
STORM SIGNALS ALONG THE SEACOAST.

A red flag with a black center indicates that the storm is expected to be of marked violence.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from northeast to south); white, westerly (from southwest to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrant; below, from the southerly quadrant.



Northwesterly winds.



Southwesterly winds.



Northeasterly winds.



Southeasterly winds.

By night a red light will indicate easterly winds and a white light above a red light will indicate westerly winds.

The "Information Signal" consists of a red pennant of the same dimensions as the red and the white pennants (direction signals), and when displayed indicates that the local observer has received information from the central office of a storm covering a limited area, dangerous only for vessels about to sail to certain points. The signal will serve as a notification to shipmasters that the necessary information will be given them upon application to the local observer.

APPENDIX III.

REGULATIONS U. S. MARINE HOSPITAL SERVICE.*

APPROVED MAY 20, 1889.

(EXTRACTS.)

GENERAL DUTIES OF MEDICAL OFFICERS.

84. The duties of officers of the medical corps are professional, sanitary, and executive.

General duties.

85. The professional duties of a medical officer are to examine all applicants for relief, to prescribe and furnish medicine or hospital treatment as may be required, and to make physical examinations of seamen of the several Government services and merchant marine, under such regulations as shall hereinafter appear.

Professional duties.

PROFESSIONAL DUTIES.

88. Medical officers will, upon the application of any United States shipping commissioner, or the master or owner of any United States vessel engaged in the foreign trade, or of any passenger steamer engaged in the coasting or inland navigation trade, examine as to his physical condition any seaman brought to them for that purpose, and will give a certificate (Form 1928) as to his fitness or unfitness for service. They will physically examine, in accordance with existing regulations governing the physical examination of American seamen, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line or the consul representing the nation to which the vessel belongs. A fee of fifty cents will be charged for such examinations of foreign seamen. * * * Medical officers will also, upon the application of the proper officers, examine enlisted men and persons desiring to enlist in the Revenue Marine, Life Saving, Coast Survey, and Light-House Services, or to instruct them in the mode of resuscitating persons apparently drowned. No fee will be charged for this service.

To examine applicants for relief, and certain other persons as to physical qualifications for enlistment in Government service.

89. Medical inspections of seamen, with reference to their fitness for service, will be made only at the respective marine hospital offices, except at certain stations * * * in special cases.

Examinations to be made at offices.

90. No fee will be charged by any medical officer of the Marine Hospital Service for the medical inspection of any American seaman or for making a certificate as to his physical condition.

No fee to be charged.

91. When requested by the local inspectors of steam vessels or other proper officers, medical officers and acting assistant surgeons will examine applicants for pilots' license as to acuteness of hearing, color blindness, and general visual capacity, and will give a certificate accordingly.

Color blindness and visual tests.

SANITARY DUTIES.

95. Upon the outbreak of epidemic smallpox at or near a relief station, medical officers and acting assistant surgeons will vaccinate such seamen as may come to the marine hospital office for the purpose; and officers are authorized, at all times, to visit vessels to examine and vaccinate crews. * * *

To vaccinate seamen.

RELIEF STATIONS.

133. A relief station of the Marine Hospital Service is a port situated on any navigable water of the United States where an officer of the customs or Marine Hospital Service is on duty.

Definition.

134. All relief stations, where the service is under the charge of a medical officer of the Marine Hospital Service shall be known as relief stations of Class 1. Relief stations where specific arrangements have been made for the care and treatment of sick

Classes.

*The Marine Hospital Service is the medical department for the mercantile marine of the United States. It was established in 1798, and is charged with preserving the health interests of the officers and seamen employed on American vessels engaged in the foreign, coastwise, and inland commerce.

or disabled seamen at rates fixed by the Treasury Department, but where collectors of customs, on account of the absence of a medical officer of the service, are authorized and required to issue permits and to supervise the relief furnished, shall be known as relief stations of Class 2. All other ports where there are officers of the customs revenue, but where, on account of the infrequency of application for relief, the absence of any hospital, or from other causes, sick or disabled seamen are cared for only in cases of emergency, shall be known as relief stations of Class 3.

Districts.

135. The relief stations of the Marine Hospital Service are grouped into eight districts, as follows: The District of the North Atlantic, the District of the Middle Atlantic, the District of the South Atlantic, the District of the Gulf, the District of the Ohio, the District of the Mississippi, the District of the Great Lakes, and the District of the Pacific.

North Atlantic.

136. The district of the North Atlantic embraces the following named relief stations, viz: Barnstable, Mass.; Boston, Mass.; Chatham, Mass.; Dennis, Mass.; Edgartown, Mass.; Gloucester, Mass.; Hyannis, Mass.; New Bedford, Mass.; Newport, R. I.; Providence, R. I.; Provincetown, Mass.; Salem, Mass.; Vineyard Haven, Mass.*

Location of offices and dispensaries.

147. The marine hospital dispensary shall be located at the custom-house whenever practicable, and suitable office room for that purpose will be set apart, * * * subject to the approval of the Secretary of the Treasury.

BENEFICIARIES OF THE SERVICE, AND THE MANNER IN WHICH RELIEF IS EXTENDED TO THEM.

List of persons entitled to relief.

149. The persons entitled to the benefits of the Marine Hospital Service are those employed on board in the care, preservation, or navigation of any vessel of the United States, or in the service, on board, of those engaged in such care, preservation, or navigation, excepting persons employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade.

Wrecked seamen entitled.

150. Seamen taken from wrecked vessels under the United States flag, if sick or disabled, are entitled to the benefits of the Marine Hospital Service and will be furnished care and treatment without reference to the length of time for which they have been employed.

Seamen sent by consular officers entitled.

151. Destitute American seamen returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Marine Hospital Service.

Seamen must make application for relief.

152. A sick or disabled seaman, in order to obtain the benefits of the Marine Hospital Service, must apply to a medical officer of that service, or, in the absence of such officer, then to the proper customs officer, * * * and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant. Form 1914.

153. Masters' certificates and discharge papers from United States shipping commissioners, properly made out and signed, showing that the applicant has been employed on a documented vessel or vessels of the United States for at least sixty days immediately preceding his application for relief, shall, in general, be held to constitute the "satisfactory evidence" required.

Certificates from owners or agents as evidence.

154. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Masters enjoined to furnish certificate of service.

155. Masters of vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1914) of the length of time said seaman has been so employed, giving the date of his last employment and the date of his discharge. This certificate will be filed in the marine hospital office, or office of the customs officer, upon application being made for relief, whether the relief is furnished or the claim rejected.

Masters refusing to give certificate.

156. In case the master of any vessel shall fail or refuse to furnish a masters' certificate to any seaman that may have been employed on board said vessel within thirty days preceding the seaman's application for relief, the collector of customs shall cause said master, if he be in port, to appear at the marine hospital office and produce the ship's books. Any master of a vessel who shall furnish a false certificate of service, with the intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution.

*Contracts, at different places, for the care of seamen entitled to relief from the Marine Hospital Service are made annually and the right is reserved by the Secretary of the Treasury to terminate any contract whenever the interests of the service require it.

157. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel.

Seaman to sign certificate.

158. During the season when navigation is open at any port, seamen at that port are not entitled to relief from the Marine Hospital Service, who, from any cause other than disease or injury, have not, within the sixty days immediately preceding the application for relief, been employed on any American vessel.

Requirements as to service.

159. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation, such interval shall not be considered as excluding him from relief, except the sickness or injury for which he applies for relief be the direct result of employment on shore, nor shall the phrase "immediately preceding the application" be held as excluding from relief a seaman who has been but a few days away from his vessel, provided he has not abandoned his vocation as seaman; nor as excluding a seaman who may have been not exceeding two months away from his vessel, provided it be satisfactorily shown that such absence was due to sickness.

Exceptions.

160. During the season when navigation is closed at any port, seamen at that port are not entitled to relief from the Marine Hospital Service, who, from any cause other than disease or injury, have not been employed on board an American vessel within a period exceeding thirty days prior to the closure of navigation.

Closure of navigation.

161. A seaman who has abandoned his vocation for any employment on shore for a period of two months or more, unless debarred from shipping by reason of sickness, disability, or closure of navigation, has thereby forfeited his claim to the benefits of the Marine Hospital Service.

Forfeiture of claims for abandoning vocation.

162. Whenever an applicant for relief presents himself at the marine hospital office or the custom-house without a master's certificate or shipping commissioner's discharge, and it is impracticable to obtain a master's certificate on account of the absence of the vessel or its master from the port, the affidavit of the applicant as to the facts of his last employment may be accepted as evidence in support of his claim for the benefits of the Marine Hospital Service. The applicant's affidavit may also be accepted as evidence in cases where the period of his last service, as shown by his papers, is less than sixty days.

Affidavits may be accepted as evidence.

163. When the period of the seaman's service on last vessel is less than two months, his statement as to previous service may be accepted if supported by satisfactory evidence.

Brief service on last vessel not a bar to relief.

169. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid from the Marine Hospital fund.

Expenses for sickness during voyage.

170. No relief will be furnished at the expense of the Marine Hospital fund, except upon the certificate and recommendation of a medical officer of the Marine Hospital Service, or of a competent physician, showing that the applicant requires medical treatment.

Relief only upon certificate of officers.

171. In no case will money be paid to a seaman himself, or to his family or friends, out of the Marine Hospital fund, as reimbursement for expenses incurred during sickness or disability.

Money not to be paid to seamen for expenses of sickness.

172. The expenses for the care and treatment of seamen entitled to the benefits of the Marine Hospital Service who, in accordance with the State or municipal health laws and regulations, are taken to quarantine or other hospitals under charge of the local health authorities, will not be paid from the Marine Hospital fund.

Seamen admitted to quarantine hospitals.

DISPENSARY RELIEF.

173. Sick and disabled seamen entitled under these regulations to the benefits of the Marine Hospital Service whose diseases or injuries are of such a nature that they can properly be relieved by medicine, or dressing, or advice, without admission to hospital, will be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require.

Cases to be treated at dispensary as out-patients.

174. Seamen will not be furnished relief at their own homes, except by special authority from the Supervising Surgeon-General of the Marine Hospital Service, and then an allowance for medical attendance and medicines only will be made at rates fixed by the Treasury Department.

No relief furnished at homes of patients.

STATIONS OF THE THIRD CLASS.

177. Whenever, at a third-class relief station, an application for relief is presented, the customs officers for the port are authorized and directed to cause outdoor or office relief (medicines, surgical appliances, etc.) to be furnished in accordance with

Provisions for relief.

paragraph 173, or to furnish transportation to a relief station of the first or second class, as the case may be. But when the amount of the appropriation is insufficient, any relief station of the third class may be discontinued.

Temporary arrange-
ments to be made.

178. Whenever, in the opinion of the examining physician, the patient is unable to bear transportation without prejudice to his recovery, the facts will be at once reported to the Supervising Surgeon-General for instructions, and in case immediate medical or surgical attendance is necessary, the customs officer will, pending action upon the case, provide it, if possible, at reasonable and just rates. The customs officer will in such cases employ a competent physician to take professional charge of the patient, and will arrange for suitable quarters, nursing, and diet for the patient, and the arrangements made by him will be reported, together with the rates of charges therefor.

Foreign seamen et al.
not treated.

181. Foreign seamen, or employes of the various Government services, will not be treated at stations of the third class.

HOSPITAL RELIEF.

Cases for hospital
treatment.

184. A sick or disabled seaman entitled to the benefits of the Marine Hospital Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of a medical officer or acting assistant surgeon of the Service, or of a reputable physician designated by the Department to act at a place where no medical officer is stationed.

STATIONS OF THE FIRST CLASS.

Bed tickets to be
issued.
Form 1917.

185. At relief stations where United States marine hospitals are located, the bed ticket will be prepared at the marine hospital office, and given to the patient, and the patient will be admitted on presentation of said bed ticket inclosed in a sealed envelope.

To be valid only for
day of issue.

186. The bed ticket, * * * unless presented on the day it is issued, * * * will be forfeited.

STATIONS OF THE SECOND CLASS.

Permits for hospital
relief.
Form 1916.

194. Customs officers or acting assistant surgeons will issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the service and require hospital treatment. * * *

Permits valid only on
day of issue.

196. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the medical officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the permit will be forfeited.

Applications for relief
after office hours.

197. When, at a second-class station, a seaman entitled to the benefits of the Service makes application for admission to hospital after the custom-house or dispensary is closed for the day, the surgeon in charge of the hospital in which the patients of the Marine Hospital Service are treated may receive the patient, should the case be urgent. * * *

Permits may be ante-
dated.

198. In no case will a permit be antedated, except as provided in the foregoing paragraph, and only to cover one working day exclusive of legal holidays.

Relief not to be given
on antedated permits.

199. Sick and disabled seaman presenting themselves at any hospital where patients of the Marine Hospital Service are cared for, with hospital permits dated prior to the day when presented, will not be treated at the expense of the marine hospital fund, except under such provisions as are prescribed by these regulations.

Relief not to exceed
sixty days.

200. Continuous relief for periods exceeding sixty days will in no case be granted, except by special authority from the Department.

STATIONS OF THE THIRD CLASS.

Emergency cases only
treated in hospital.

207. Hospital relief at stations of the third class will not be furnished except in cases of emergency and for a temporary period, under the special provisions of paragraph 178 of these Regulations.

INSANE SEAMEN.

Relief for insane sea-
men.
March 3, 1875, a. 5.

212. Insane seamen entitled to the benefits of the Marine Hospital Service may be admitted to the Government Hospital for the Insane upon the order of the Secretary of the Treasury, and the officers in charge of relief stations will report to the Supervising Surgeon-General any application for admission to hospital made in behalf of such seamen, and any cases of insanity that may occur among them. * * *

DECEASED SEAMEN.

213. On the death of a patient while under the charge of the Marine Hospital Service, notice to receive his effects shall be given by letter, or otherwise, to his nearest known relative. * * * Relatives to be notified.

216. The necessary expenses of a plain burial for deceased patients of the Service will be paid; but no part of the expenses of the burial of any deceased seaman will be paid for at the expense of the marine hospital fund, unless said seaman was at the time of his death a patient of the Service. Burial expenses.

FOREIGN SEAMEN AND EMPLOYÉS OF GOVERNMENT SERVICES.

217. The accommodations provided for the care and treatment of the patients of the Marine Hospital Service are also available to foreign seamen only at relief stations where medical officers or acting assistant surgeons are on duty, upon the application of the consular officers of their respective nationalities, or upon the application be the masters of the vessels upon which said seamen serve, provided satisfactory security is given for the payment of the expenses of such care and treatment. * * * Foreign seamen may be treated.

218. Seamen employed on vessels of the Navy, or the Coast Survey, may be admitted for care and treatment as patients of the Marine Hospital Service only upon the written request of their respective commanding officers. * * * Seamen of various Government services may be admitted.

Officers and seamen of the Revenue Cutter Service will be admitted to care and treatment at all stations of the first-class, without reference to length of service, and without charge.

221. Customs officers acting as agents of the Marine Hospital Service will collect all bills for the care and treatment of foreign seamen by the Marine Hospital Service. * * * * * * * * accounts.

TONNAGE DUES.

304. Customs officers will collect from vessels arriving in the United States from any foreign port of North America north of the southern terminus of the Isthmus of Darien, or any port in Newfoundland, the West Indian, Bahama, Bermuda, or Sandwich Islands, a duty of three cents per ton on every entry; but the total tax in any one year on entries from the ports specified is not to exceed fifteen cents. The tax to be collected on vessels making entry on arrival from other foreign ports is six cents per ton on every entry; but the total tax collected at six cents per ton is not to exceed thirty cents per ton in any one year. Rates for assessment.
U. S. Stat., C. 121,
1884. Act June 26.

305. Any vessel making such voyages as to become liable in any one year under both rates—that is, at three cents per ton and six cents per ton—shall not be held liable to an aggregate tax of more than thirty cents per ton for any one year, reckoned from the date of the entry and payment of her first tax at either rate; but the three-cent tax per ton shall not be collected on more than five entries in any one year. Number of times tax may be assessed.

306. For half a ton or more than half a ton of the measurement of a vessel, collection will be made at the full rates of three or six cents per ton; for less than half a ton, no collection will be made. Small craft exempt.

307. As provided by the act of June 26, 1884, "that the President of the United States shall suspend the collection of so much of the duty herein imposed on vessels entered from any port in the Dominion of Canada, Newfoundland, the Bahama Islands, the Bermuda Islands, the West India Islands, Mexico, and Central America, down to and including Aspinwall and Panama, as may be in excess of the tonnage and lighthouse dues, or other equivalent tax or taxes, imposed on American vessels by the government of the foreign country in which such port is situated, and shall upon the passage of this act, and from time to time thereafter as often as it may become necessary by reason of changes in the laws of the foreign countries above mentioned, indicate by proclamation the ports to which such suspension shall apply, and the rate or rates of tonnage duty, if any, to be collected under such suspension," but customs officers will take no action by way of suspension of collection of tax till they have been informed that such suspension has been authorized by a proclamation of the President. Dues suspended reciprocally.

NATIONAL QUARANTINES.

325. The following permanent quarantines have been established according to law: one at the mouth of Delaware Bay; one near Cape Charles at the entrance of Chesapeake Bay; one on Blackbeard Island in Sapelo Sound; one at Garden and Bird Keys, Tortugas Islands; one at North Chandeleur Island. * * * Permanent quarantines.
Act Aug. 1, 1888.

Pilots and others must
obey regulations.
Act Aug. 1, 1888.

326. "Whenever any person shall trespass upon the grounds belonging to any quarantine reservation, or whenever any person, master, pilot, or owner of a vessel entering any port of the United States, shall so enter * * * in violation of the quarantine regulations, * * * such person trespassing, or such master, pilot, or other person in command of a vessel shall, upon conviction thereof, pay a fine of not more than three hundred dollars, or be sentenced to imprisonment for a period of not more than thirty days, or shall be punished by both fine and imprisonment, at the discretion of the court." * * *

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service.

Extracts.

[Approved February 15, 1893.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any merchant ship or other vessel from any foreign port or place to enter any port of the United States, except in accordance with the provisions of this act and with such rules and regulations of State and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof shall forfeit to the United States a sum, to be awarded in the discretion of the court, not exceeding five thousand dollars, which shall be a lien upon said vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 2. That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer, where such officer has been detailed by the President for that purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew; and said consular or medical officer is required, before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulation be allowed, to be accounted for as is required in other cases.

The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore mentioned. Any vessel clearing and sailing from any such port without such bill of health, and entering any port of the United States, shall forfeit to the United States not more than five thousand dollars, the amount to be determined by the court, which shall be a lien on the same, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 5. That the Secretary of the Treasury shall from time to time issue to the consular officers of the United States and to the medical officers serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing the best sanitary condition of such vessels, their cargoes, passengers, and crew, before their departure for any port in the United States, and in the course of the voyage; and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases; and it shall not be lawful for any vessel to enter said port to discharge its cargo, or land its passengers, except upon a certificate of the health officer at such quarantine station certifying that said rules and regulations have in all respects been observed and complied with, as well on his part as on the part of the said vessel and its master, in respect to the same and to its cargo, passengers, and crew; and the master of every such vessel shall produce and deliver to the collector of customs at said port of entry, together with the other papers of the vessel, the said bills of health required to be obtained at the port of departure and the certificate herein required to be obtained from the health officer at the port of entry; and that the bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

SEC. 6. That on the arrival of an infected vessel at any port not provided with facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any of port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station.

SEC. 7. That whenever it shall be shown to the satisfaction of the President, that by reason of the existence of cholera or other infectious or contagious diseases in a foreign country there is serious danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

REGULATIONS FOR MARITIME QUARANTINE AT UNITED STATES PORTS.

ARTICLE I.—INSPECTIONS.

1. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry.*

A. Any vessel with sickness on board.

B. All vessels from foreign ports.

Exceptions.—Vessels not carrying passengers on inland waters of the United States. Vessels from the Pacific and Atlantic coasts of British America, provided they do not carry persons or effects of persons nonresident in America for the ninety days next preceding arrival, and provided always that the port of departure be free from quarantinable disease. Vessels from other foreign ports via these excepted ports shall be inspected.

C. Vessels from foreign ports having entered a port of the United States without complete discharge of passengers and cargo. Such vessels shall be subject to a second inspection before entering any other port. Vessels from ports suspected of infection with yellow fever, having entered a port north of the southern boundary of Maryland without disinfection, shall be subjected to a second inspection before entering any port south of said latitude during the quarantine season of such port.

RULES FOR THE GOVERNMENT OF NATIONAL QUARANTINES.

ART. VIII. At United States ports where there is neither national nor local quarantine, vessels will not be admitted to entry until the collector of customs shall be satisfied that the vessel may be admitted without danger to the public health; and in case the said vessel shall be found to have quarantinable disease on board, or to have had such disease on board during the voyage, the collector of customs at such port may remand such vessel to the nearest national or other quarantine station where proper accommodations and appliances are provided, there to undergo purification and disinfection according to the regulations governing national quarantines.

1. Quarantine will be maintained at South Atlantic and Gulf Quarantine Stations from May 1 to November 1, and at Dry Tortugas from April 15 to November 15.

Boarding and inspection stations will be maintained throughout the year.

2. Quarantinable diseases are cholera, yellow fever, smallpox, plague, and typhus fever.

3. Vessels shall be inspected, without avoidable delay, between sunrise and sunset.

4. The quarantine officer shall at once demand from the master the prescribed bill of health. Should the vessel have no bill of health, she shall be detained and the fact reported at once to the collector of customs.

5. In making an inspection of a vessel the bill of health, ship's log, and crew and passenger lists and manifests shall be examined, together with clinical record of all cases treated in hospital during the voyage. The crew and passengers shall be mustered, according to the lists, and any discrepancies found investigated.

6. Vessels arriving at any national quarantine station having quarantinable diseases on board, or having had cases during the voyage, or at port of departure, shall be placed in quarantine. After certificate of discharge shall have been given by the United States quarantine officer at said station, the vessel shall be admitted to entry under section 6 of act of February 15, 1893.

* At ports at which there is no quarantine officer any physician authorized by the surveyor or collector of customs for the purpose of making inspection shall be considered as a quarantine officer *pro tem*.

7. Pilots bringing infected vessels will be detained in quarantine a sufficient time to cover the period of incubation of the disease for which the vessel is quarantined, or if, in the opinion of the quarantine officer, such pilots have been exposed to infection. The dunnage of pilots shall be disinfected when necessary.

17. The detention of vessels for cholera, yellow fever, smallpox, and typhus fever shall cover the period of incubation of the disease, the time of detention to commence from the date of last exposure. Yellow fever, not less than five days; typhus fever, not less than twenty days; smallpox, except in cases of successful vaccination, not less than fourteen days; cholera, not less than five days.

18. Steam vessels from suspected or infected ports where yellow fever prevails may be allowed to enter at the port of Baltimore and ports north of Baltimore, Md., after five days from date of departure from such port, without disinfection or detention, unless in bad sanitary condition, or with bad sanitary history. In either case they will be detained in quarantine five days after disinfection. This regulation to apply to the North Atlantic coast only.

19. A vessel calling for orders, supplies, or coal only may be allowed to proceed, unless there is a quarantinable disease on board at the time, or such disease has been on board at ports en route, or at ports of departure, and when she is believed to be infected, in which case coal or supplies by barge can be towed to her, and she can take the coal or supplies from the barge with her own crew; but the local health officer at the port shall allow no person or dunnage from such vessel to go ashore.

20. * * * Passengers and crews detained at any national quarantine will be subject to rules and regulations promulgated from time to time by the Supervising Surgeon General for their government.

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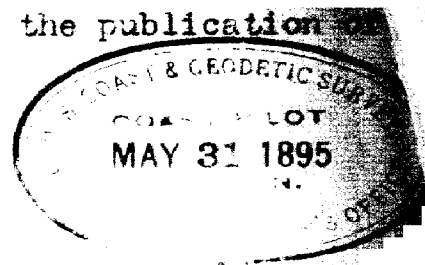
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Additional information and changes since the publication of
supplement to Part III, U.S. Coast Pilot.

ISSUED



Page 110 (volume).-

Flum Beach Shoal buoy is now a black bell buoy, no number.

Pages 119, 120 (volume).-

A shoal spot having 10 feet of water over it has been found
about 300 yards S. by W. from James Ledge; it is marked by a
red and black horizontally striped spar buoy.

Pages 10 and 47 (volume).-

A lighted range light has been placed at South Boston to
guide vessels through President Roads from near Nix Mate. The front
range light consists of two red lens lanterns, placed 10 feet apart
horizontally, and the rear light of one lens lantern.

Pages 86 and 87 (volume).-

Two beacon lights have been established in Woods Hole: one
consists of a red lantern light placed on the spindle on Grassy
Island, and the other of two red lantern lights, one vertically
below the other, on the spindle on Middle Ledge.

This volume has been corrected for the more important information
(affecting it) received at the office since the date of
publication. Minor changes in buoyage &c. are not noted.

